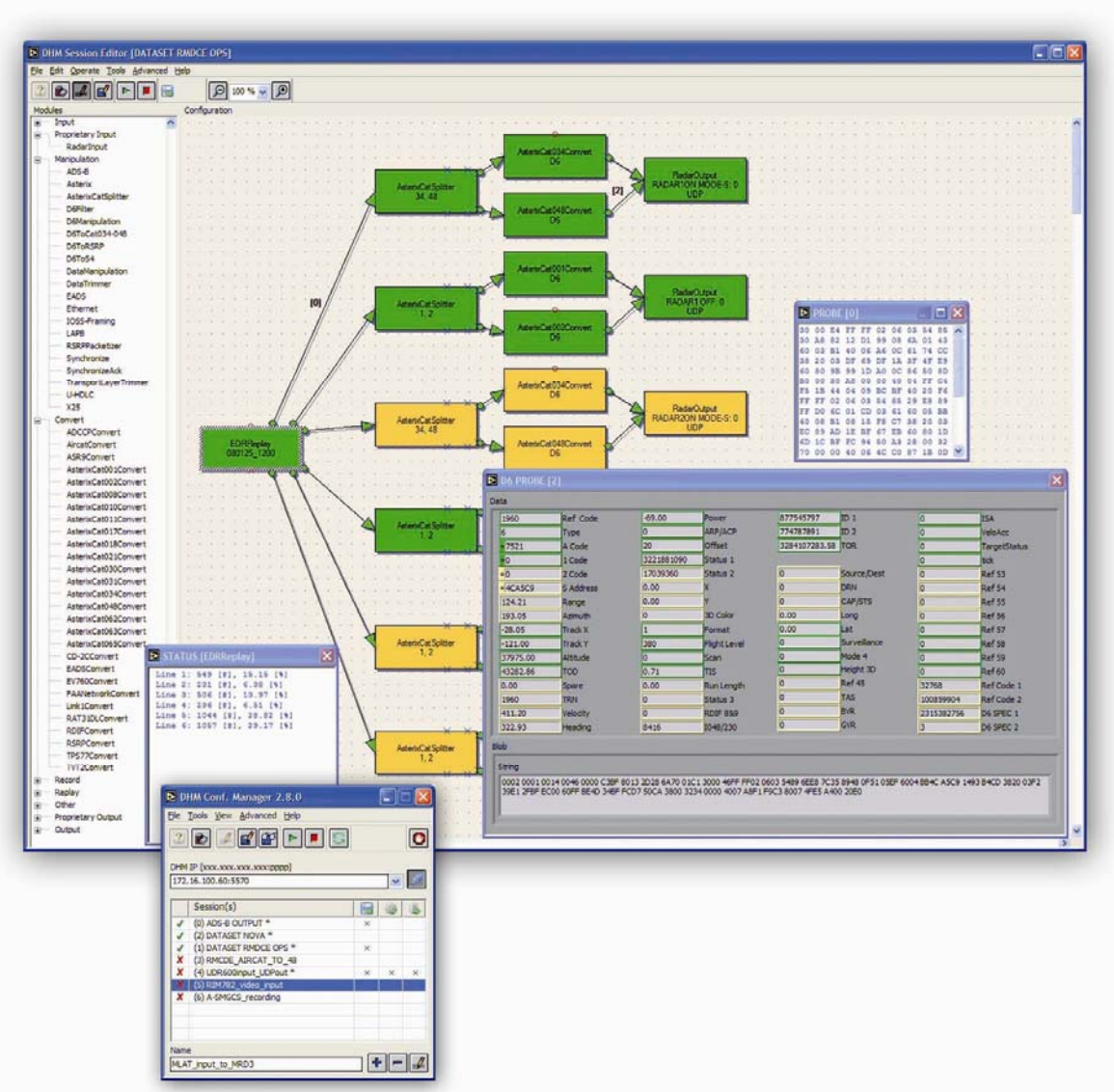
RASS-R Data Handling Module



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Abstract

The RASS-R Data Handling Module User manual describes the Data Handling module and the software components of which it is built.
This manual supplements the RASS-R Toolbox manual, and assumes that you are familiar with that material. You should also be familiar with the operation of your computer, your computer's operating system and the Intersoft Electronics specific hardware for Radar Data I/O.

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CONVENTIONS USED IN THIS MANUAL

The following conventions are used in this manual:

Note: This icon to the left of bold italicized text denotes a note, which alerts you to important information.

Caution: This icon to the left of bold italicized text denotes a caution, which alerts you to the possibility of data loss or a system crash.

Warning: This icon to the left of bold italicized text denotes a warning, which alerts you to the possibility of damage to you or your equipment.

GLOSSARY

ACC	Air traffic Control Centre
ACP	Azimuth Change Pulse
ADS-B	Automatic Dependent Surveillance, Broadcast
ARP	Azimuth Reference Pulse
Asterix	**A**ll Purpose **St**ructured **E**urocontrol **R**adar **I**nformation E**x**change
Asterix Data Block	Unit of information seen by the application as a discrete entity by its contents. A Data block contains one or more Record(s) containing data of the same category.
Asterix Record	A collection of transmitted Data Fields of the same category
ATC	Air Traffic Control
Baud	Unit of signal frequency in signals per second. Not synonymous with bits per second since signals can represent more than one bit. Baud equals bits per second only when the signal represents a single bit.
Buffer	Temporary storage for acquired or generated data.
Byte-stream	A byte stream is an abstraction used in computer science to describe a particular kind of communication channel between two entities. It is a channel (often bidirectional, but also unidirectional) down which one entity can send a sequence of bytes to the entity on the other end. In almost all instances, the channel has the property that it is reliable; i.e. the exact same bytes emerge, in the exact same order, at the other end.
CAT001	Monoradar Data Target Reports, from a Radar Surveillance System to an SDPS (plots and tracks from PSRs, SSRs, MSSRs, excluding Mode S and ground surveillance)
CAT002	Monoradar Service Messages (status, North marker, sector crossing messages)
CAT034	Monoradar Service Messages, next version of CAT002
CAT048	Monorader Data Target Reports, next version of CAT001
COTS	Commercial Off The Shelf
D6	Intersoft Electronics internal Radar data format, plot or track based.
Data bits	In data communications, the number of bits used to send each character, not including any added timing or error checking bits
DCE	Data Communications Equipment. The local and/or remote modem. A DCE is usually connected to a DTE.
DHM	Data Handling Module
DTE	Data Terminal Equipment. The computer or terminal, either local (yours), or the remote (the one you're communicating with). A DTE is usually connected to a DCE.
EDR	Intersoft Electronics internal data format for record based data. Also stands for Extended Data Recorder, a device for generating and capturing serial data.
EDR V2	Second version of the EDR format.
Ethernet	A network specification developed by DEC, Intel, and Xerox which provides anywhere from 10 megabits to 1000 megabits per second transmission speeds.
Event	Event, signals occurrences between event source and receiving software module, Events include North, Time, ACP/ARP
FDDI	Fiber distributed data interface

FIFO	A first-in-first-out memory buffer. In a FIFO, the first data stored is the first data sent to the acceptor.
Flow control	A method of controlling when information is sent
GPS	Global Positioning System
HDLC	Abbreviation for High Level Data Link control. A Link-Level protocol used to facilitate reliable point-to-point transmission of a data packet. Note: A subset of HDLC, known as 'LAP-B,' is the Layer-two protocol for CCITT Recommendation X.25.
Hex	Hexadecimal. 16 based numbering system ranging from 0 to F
ICD	Interface Control Document
IE	Intersoft Electronics
I/O	Input/Output
IP	Internet Protocol
LAN	Local Area Network
LAPB	Link Access Protocol for Channel B. (ISDN, Data Link). The balanced-mode, enhanced version of HDLC. Used in X.25 packet-switching networks.
LCN	The LCN is an index number which identifies a circuit between endpoints on an X.25 network.
MB	Megabytes of memory.
Memory buffer	*See* buffer.
MIB	Management Information Base
Monopulse	Radar-receiving processing technique used to provide a precise bearing measurement
MSSR	Monopulse Secondary Surveillance Radar
NM	Nautical Mile, unit of distance
Path	A path can be described as a file's address on your file system, describing where the file lives: An absolute path gives the complete path, starting at the root directory, or the very top of the filesystem; A relative path looks for a file from the directory you are currently in down.
Pcap	Package capture, raw network packages format.
POEMS	Pre-Operational European Mode-S
PSR	Primary Surveillance Radar
PVC	Permanent Virtual Circuit
Radar	Radio Detection And Ranging
RAID	Redundant Array of Independent Disks. Overall term for computer data storage schemes that can divide and replicate data among multiple hard disk drives to improve data reliability and/or increase input/output performance
RASS-R	Radar Analysis Support Systems – Real-time measurements
RASS-S	Radar Analysis Support Systems – Site measurements
RCS	Radar Cross Section
RDP	Radar Data Processing (system)
Record	A collection of data forming a complete message.
RS323, RS422	The Electronics Industry Association (EIA) has produced standards for RS232 and RS422 that deal with data communications.
RF	Radio Frequency
RMCDE	Radar Message Convert and Distribution Equipment
RTQC	Real Time Quality Control
RX	Receiver

SAC	System Area Code
SIC	System Identification Code
SLS	Side Lobe Suppression, a technique to avoid eliciting transponder replies in response to interrogations transmitted via antenna sidelobes
SNMP	Simple Network Management Protocol. Internet Suite Protocol used in network management systems to monitor network-attached devices.
SSR	Secondary Surveillance Radar
Stop bits	Used to indicate the end of each character as it is transmitted
SVC	Switched Virtual Circuits
TCP	Transmission Control Protocol
Timeout	A timeout occurs when a device has waited too long for another device to send or receive a transmission.
TMD	Technical Maintenance Display
Transponder	Airborne unit of the SSR system, detects an interrogator's transmission and responds with a coded reply stating either the aircraft's identity or its flight level
TTL	Time To Live. An internet header field which indicates the upper bound on how long this internet datagram may exist.
TX	Transmitter
UAP	User Application Profile, used in Asterix data for assigning Data Items to Data Fields.
UDP	User Datagram Protocol. A connectionless, unreliable Internet protocol.
UTC	Coordinated Universal Time
X.25	X.25 is the CCITT's recommendation for the interface between a DTE and DCE over a Public Switched Telephone Network (PSTN). Generally, X.25 covers layers 1 to 3 of the ISO communication model, but the term is used here to refer specifically to packet layer 3. X.25 is carried within the Information Field of LAPB frames.

1 Introduction

The RASS-R Data Handling Module (DHM) is a radar data input/output system.
On the one hand it can run as RMCDE, large scaled in an ACC or smaller setup on the radar site. On the other hand, it can be the backbone for other RASS-R programs by preprocessing data for displaying in the MRD3 and TMD3 and analysis in the TRACKAN or Radar Comparator Mono/Dual. It can also be used in combination with the Data Replay tool to reinject timestamp corrected data.
The DHM consists of 2 main parts: the **DHM Background Server** and the **DHM Configuration Manager**. The DHM "background" Server is a process that runs as a service in the background of the computer, while the DHM Configuration Manager is a HMI to connect to the DHM Server. Due to its unique design, both components offer complete scalability:

- The DHM Background Server and DHM Configuration Manager can both run on the same computer or separately on two computers (As in the figure below).
  In the latter case, the computer with the DHM Background Server on is often referred to as 'processing pc' while the DHM Configuration Manager runs on the 'monitoring pc'.
- Dependent on the required processor load, (RAID) disk space, network interface cards etc.; the DHM can run on a dedicated server, desktop or laptop.
- One or multiple DHM Servers can be combined in a network with one or multiple DHM Configuration Managers allowing remote connection and editing.
- When a licensed IE-PROXY (SNMP-agent) is running on the processing and monitoring pc's, SNMP-messages supporting Intersoft Electronics private MIB can be exchanged with any 3rd party SNMP-manager. (refer to the user manual from the IE-PROXY)
- The DHM Server allows running multiple sessions simultaneously. A session is defined as a DHM process executed on radar data.

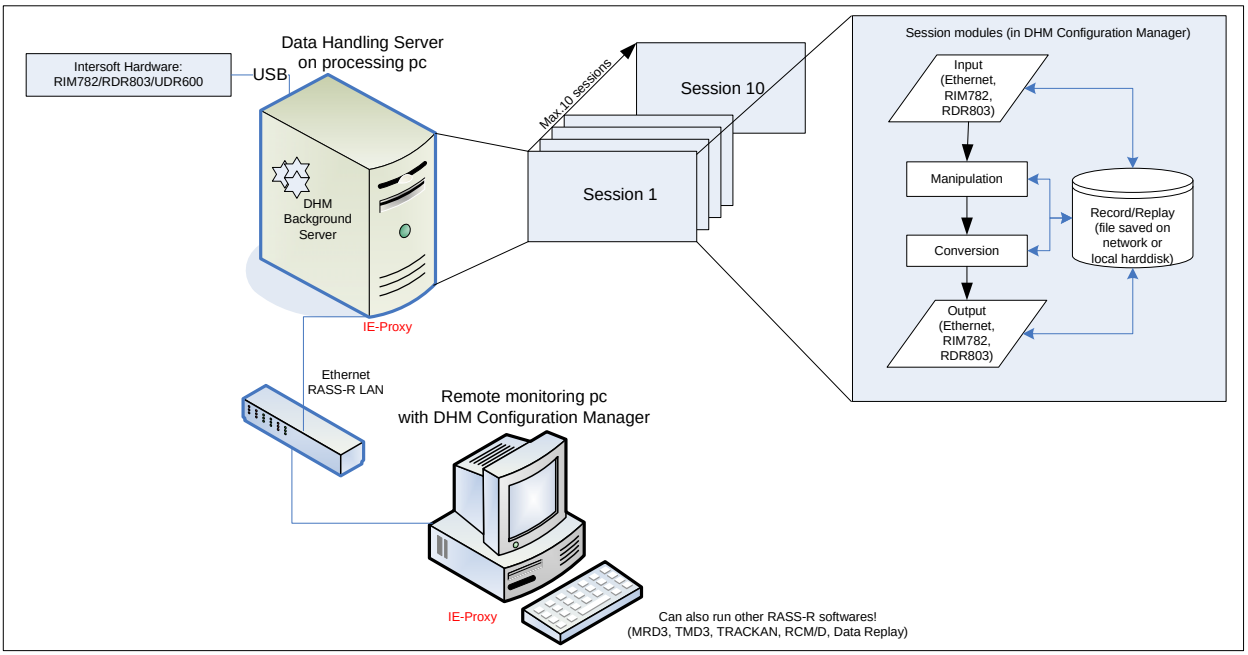


Figure 1-1: Block diagram of the DHM (processing and monitoring pc)

1.1 Benefits and possibilities of the system

- Input (recording) and output (replay) of radar data through various computer interfaces (for example Ethernet, serial port, FDDI)
- Input (recording) and output (replay) of radar data through various Intersoft Electronics hardware devices (UDR600, RIM782, RDR803, PRE790)
- Real-time filtering of data on all available data fields (for example filter on S-addresses, filter on presence of MB data)
- Scalability and reuse; new data handling modules can be plugged in (possibly into live system) as they are developed or updated and they will seamlessly integrate with existing modules.
- The same input data may be processed in different ways and be presented at different outputs.
- Different inputs may be merged to the same output.
- Data manipulation modules can take input from external source and do error correction on the life data stream.
- Protocol conversion is possible from and to any data format.
- Duplicate sessions may be configured for redundancy.
- Live testing and modification of sessions on a running system without disturbing running mission critical sessions.
- Client specific demands are easily integrated.
- Time module which can connect to a variety of sources can use this time stamp to correct or modify the data streams.
- Status reporting when used with licensed IE-Proxy SNMP agent.

2 General overview

As already explained in the introduction in the first chapter, the DHM consists of the DHM Background Server and the DHM Configuration Manager. Both applications can be run on the same computer (see figure below) or on different computers. (See Figure 1-1)
In the next paragraphs, we give a general overview of both parts.
Then, in chapter 3 you can read the details about the DHM Background Server and in chapter 4 about the DHM Configuration Manager with in chapter 5 it's Session Editor.

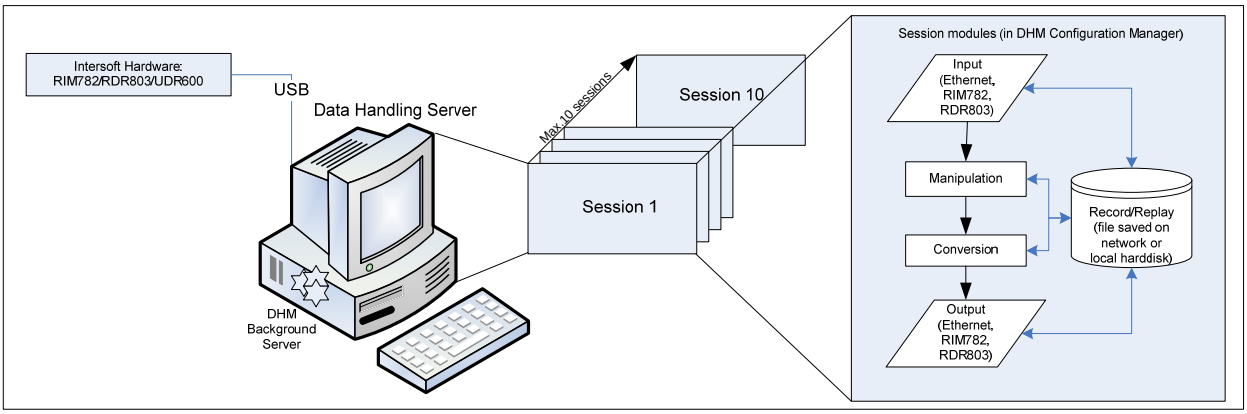


Figure 2-1: Block diagram of the DHM (single pc)

2.1 Network operation

The DHM uses several TCP/IP ports for different purposes. It is important that these ports are free for use on the target system. The table below shows an overview of the ports used by the DHM.

Table 2-1: DHM TCP/IP ports

Port number	Used by	Usage
5555	DHM Discovery	Discover DHM Background servers running on the connected networks
5570	DHM Background Server	Inter-application communication with DHM Configuration Module
5572	DHM Background Server	Webinterface; inter-application communication with TMD3
5870	DHM Configuration Manager	Inter-application communication with DHM Background Server

Should any of these ports be occupied by another essential program, the port numbers could be changed. Please contact support if this is required.

2.2 DHM Background Server

The DHM Background Server is configured to run as a Windows XP service. The module doesn't have a user interface of its own. Therefore, configuration is done with the DHM Configuration Manager.
The server module can be installed onto multiple systems. This is useful for:

- dedicated tasks
- redundancy for failsafe operation
- distributed processing

The server module can be configured to start previously stored configurations at start-up of the computer before user logon.

2.3 DHM Configuration Manager

All configuration of the DHM Background Server is done with the DHM Configuration Module. This connection can be done either remotely (as in Figure 1-1) or locally as in (Figure 2-1). The DHM Configuration Manager allows you to create, edit, run and monitor sessions on the DHM Background Server.

Sessions are built up of software components, these components can be categorized in 3 types:

Input modules, collect data from external sources, external here means external to the Data Handling Module which in itself is a software service. External sources include Ethernet, files (for recording) and hardware (for example RIM782/RDR803/UDR600 as in Figure 2-1).

Processing modules, modify, manipulate or process the data presented at the input of these modules. Modifying include stripping/adding transport layers, converting protocols and error correction.

Output modules, provide the handled data to the outside world, outside means outside of the Data Handling Module which is viewed as a software service. External destinations include Ethernet, files (for replay), hardware (for example RDR803 or UDR600 as in Figure 2-1) and special inter application data exchange protocols. (for example to send preprocessed data from the DHM to the MRD3)

Software components communicate with each other via an internal buffering system, a module's output is connected to the next module's input via a FIFO buffer.
All components are described in chapter 6.

2.4 DHM as the backbone of the RASS-R toolbox

The DHM Configuration Manager can be opened in the RASS-R toolbox.
The RASS-R toolbox is installed on your pc and has a shortcut on the desktop. It can also be accessed using the Windows Start-menu. The toolbox is displayed below. The current version of the RASS-R toolbox is displayed in the right upper corner. The DHM Configuration Manager is part of this RASS-R toolbox and can be opened using the appropriate icon .

Figure 2-2: RASS-R Toolbox

The menu bar contains the following items:

Table 2-2: RASS-R Menu bar:

Button	Usage
Help window	When this button is clicked, the Help window will appear and show help information whenever you point over a button.
Campaign change	Click this to make an appropriate campaign structure (see further)
	Under development
Site file	Under development
Print graphs	Under development
Print tables	Under development
Exit	Quit the application

When you click the button, it will ask you where you want to create your RASS-R campaign folder. Select the correct path. Upon completion, you should have the following directory structure created as in the figure below.

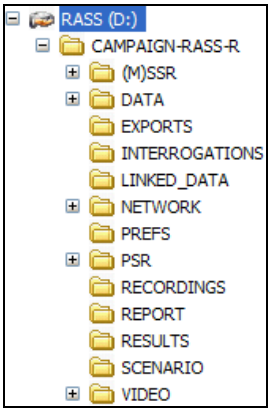


Figure 2-3: Campaign directory structure

When you make a campaign folder with the RASS-R toolbox, it is preferred to make it on a separate drive than the drive where your operation system is on. For example, as in the figure above, a structure named "CAMPAIGN-RASS-R" is created on the D-drive.

3 DHM Background Server

You might need to be logged on as an administrator or a member of the Administrators group in order to perform some tasks.

The DHM Background Server is configured to automatically run at start-up of your computer, you may alter this default setting and start the service manually when needed.
The DHM Background Server can be started using the Windows XP services management console.
To open Services, click **Start**, point to **Settings**, and then click **Control Panel**. Double-click **Administrative Tools**, and then double-click **Services**. It can also be opened by typing "services.msc" in the Run command line. For information about using Services, click **Help** on the **Action** menu in Services.
The following window appears (this window might look different on your system depending on your installation):

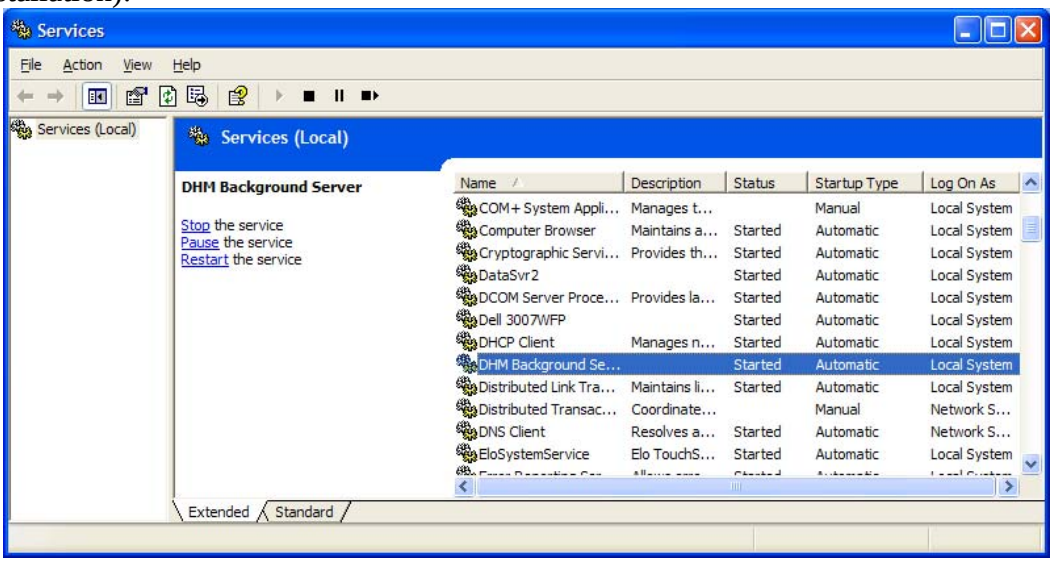

Services
File Action View Help
Services (Local)
Services (Local)
DHM Background Server
Stop the service
Pause the service
Restart the service
Name Description Status Startup Type Log On As
COM+ System Appli... Manages t... Manual Local System
Computer Browser Maintains a... Started Automatic Local System
Cryptographic Servi... Provides th... Started Automatic Local System
DataSvr2 Started Automatic Local System
DCOM Server Proce... Provides la... Started Automatic Local System
Dell 3007WFP Started Automatic Local System
DHCP Client Manages n... Started Automatic Local System
DHM Background Se... Started Automatic Local System
Distributed Link Tra... Maintains li... Started Automatic Local System
Distributed Transac... Coordinate... Manual Network S...
DNS Client Resolves a... Started Automatic Network S...
EloSystemService Elo TouchS... Started Automatic Local System
Extended Standard

Figure 3-1: Services Management Console

Locate the entry "DHM Background Server" and press the "Start Service (►)" button to start the service and press the "Stop Service (■)" button to stop the service.
After the service is running it will be visible as a separate executable named YARDIOS_SRV.exe (See Figure 4-20). Sessions can now be configured using the DHM Configuration Manager. Starting and stopping of the service can also be done by the Windows Start menu:

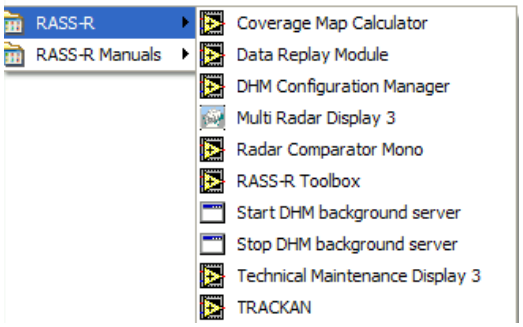


Figure 3-2: Start and stop the DHM Background Server

4 DHM Configuration Manager

When you open the DHM Configuration Manager as explained above, the following user interface will appear:

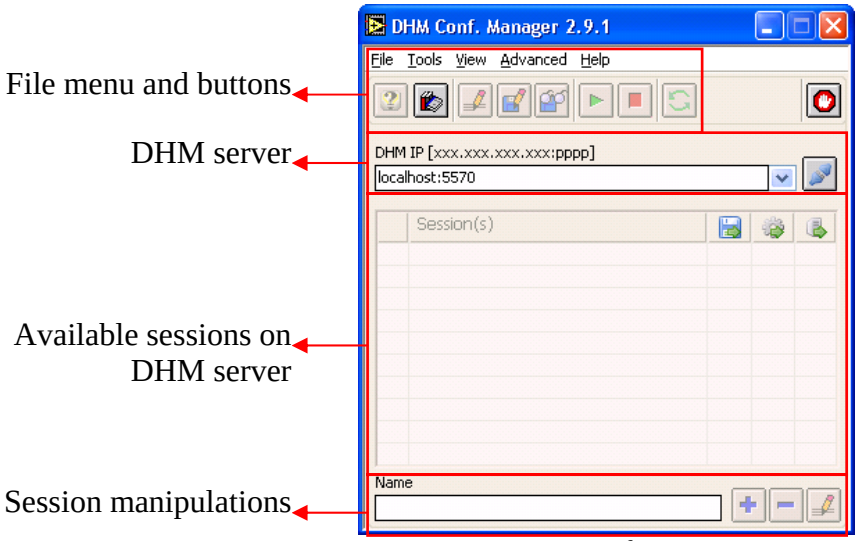


Figure 4-1: DHM Configuration Manager

In this user interface, we first see different menu items and menu buttons.
Then there is the field to select the DHM server where you want to connect to.
Thirdly you see the sessions that are running on the selected DHM server.
Finally there is space to create, add, delete and edit sessions.
All functionalities are described in detail in the next paragraphs.

4.1 User interface

4.1.1 File menu

An overview of all available menu items is given in the table below.

Table 4-1: File menu

Menu	Usage
File	
↳ Open **Ctrl+O**	Opens the Session select dialog.
↳ Save **Ctrl+S**	Saves the current session.
↳ Save a copy as	Makes and saves a copy from the current session.
↳ Save all **Ctrl+A**	Saves all loaded sessions.
↳ Delete from disk **Ctrl+D**	Deletes a session from disk.
↳ Start Session	Starts the selected session
↳ Start All	Starts all loaded sessions
↳ Stop Session	Stops the selected session
↳ Stop All	Stops all running sessions
↳ Exit **Ctrl+Q**	Exit DHM Configuration Manager
Tools	
↳ File Merger **Ctrl+M**	Opens the File Merger tool (described at the end of this manual)
↳ Advanced File Merger	Opens the Advanced File Merger tool (described at the end of this manual)
View	
↳ Module list **Ctrl+L**	Opens the Module list
↳ IP	Opens different network related functions
↳ Configuration	Opens the IP configuration dialog
↳ Statistics	Opens the IP statistics dialog
↳ Addresses	Opens the IP addresses dialog
Advanced	
↳ Rescan Modules **Ctrl+R**	Open the Rescan Modules dialog
↳ Manage USB Devices **Ctrl+U**	Manage the Intersoft hardware devices connected by USB
↳ DHM Discovery	Discover all DHM servers on the network
↳ Clear DHM IP History	Clear the IP addresses from all DHM servers stored
Help	
↳ Log On…	Log on to a DHM server
↳ Log Off	Log off from a DHM server
↳ Password **Ctrl+P**	Set password of the DHM Server
↳ Help	Open DHM User Manual
↳ About	Display version information

Menu items and buttons that can only be used in accordance with a DHM Background Server, only become active when the DHM Configuration Manager is connected to a DHM Background Server. Otherwise they are inactive!

4.1.2 Buttons

An overview of all available buttons is given in the table below.

Table 4-2: Different buttons

Button	Usage
Manual	Load User Manual
Save	Save the current session
Session load	Open the session select list to load a session
Start	Start a session
Stop	Stop a session
Rescan	Rescan all modules
Connect	Connect to a DHM server
Exit	Quit the application
Add	Add a session
Remove	Remove a session
Edit	Edit a session by opening the Session Editor (see Session editor 5)

4.2 Configuration

4.2.1 Password protection

A DHM Configuration Manager can be password protected to prevent that unauthorized personnel changes something to (critical) sessions. If you protect the DHM Configuration Manager, you automatically also protect the DHM Background Server of the local machine (it is not possible to remotely protect the DHM Background Server). The first time that you start up the DHM Configuration Manager, the following dialog automatically appears:

DHM Conf. Manager:Initialize
This DHM Conf. Manager is not password protected!
Please enable password protection if required.
OK

Figure 4-2: Password protection

By pressing OK, you will be guided to the following dialog:

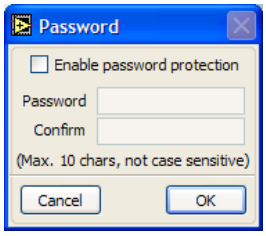


Figure 4-3: Enable password protection

When you decide to enable password protection, select the checkbox and fill in a password.

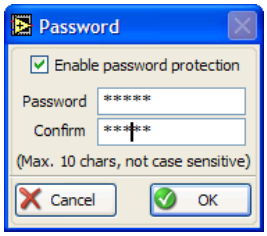


Figure 4-4: Choose password

When you confirm by pressing Enter, the next dialog appears:

Figure 4-5: Protection successful

When you open a DHM Configuration Manager with password protection, it will look as follows: a password dialog will prompt and the DHM Configuration Manager is inactive until the correct password is typed.

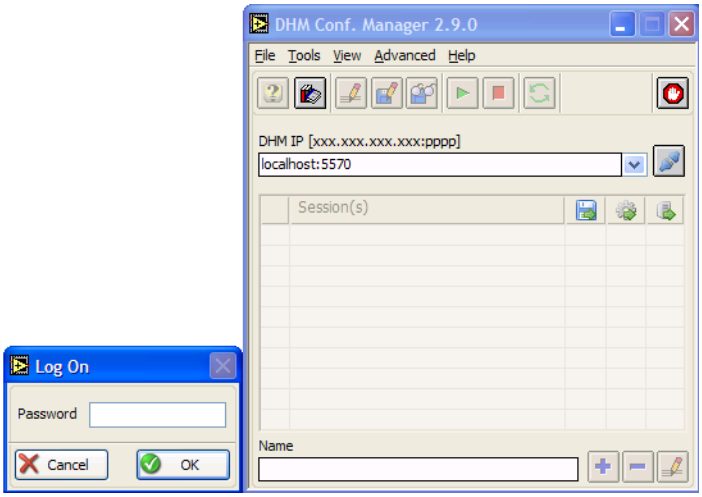


Figure 4-6: DHM Configuration Manager password protected

When you entered the wrong password, the following dialog appears, with the message in the DHM Configuration Manager indicating that there is a password protection.

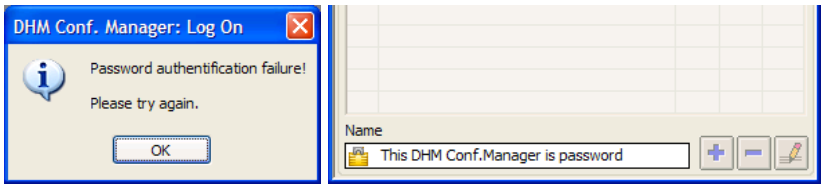


Figure 4-7: Wrong password

You can also use the log on/off menu item under “Help”.

If you want to disable or enable password protection later on, you can do this using the menu item “Password”. Unselect the checkbox to disable it. Of course, you need to be logged on first before you can disable the protection!

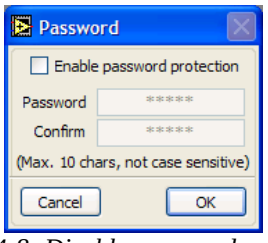


Figure 4-8: Disable password protection

4.2.2 Connecting to a DHM Background Server

Once you are logged on a DHM Configuration Manager, you can connect to a DHM Background Server. This can be done upon selection of the right DHM Background Server in the “DHM IP” field. In the figure below, we are not connected yet to a DHM Background server. As long as the Connect button is not pressed the Session field is greyed out.

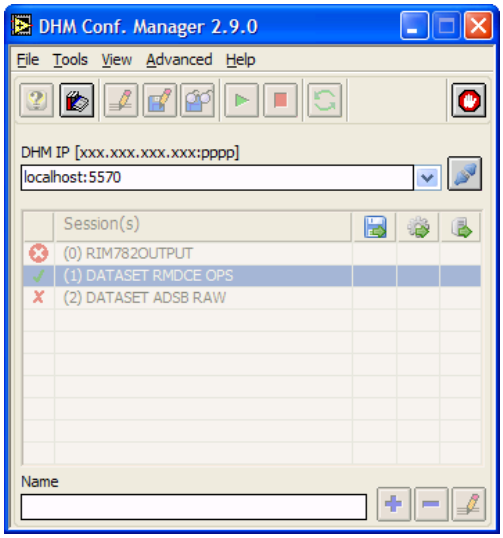


Figure 4-9: Connect to a DHM Background Server

When you open the dropdown list by clicking on the “DHM IP” field the DHM Configuration Manager sends a “DHM PING” data packet on the configured networks (see 4.2.8.3 DHM Discover). All active (=running) DHM servers will send a response and the following list (or similar) will be populated:

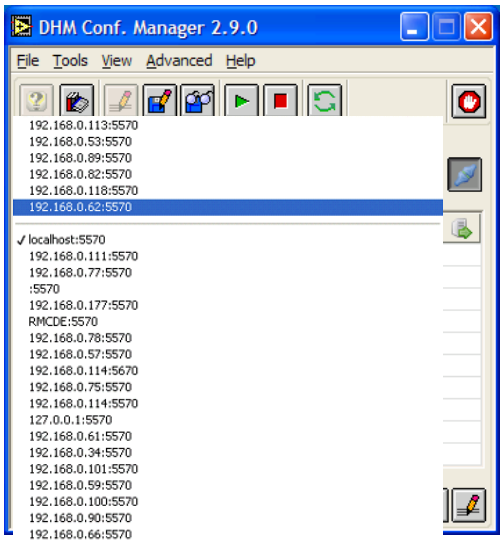


Figure 4-10: DHM server list

It gives an overview of all active and recent used DHM Background Servers running on the network (respectively above and below the horizontal line). You can use this list to select the appropriate DHM Background Server instead of manually filling in the IP address. To complete selection, now press the connect button .

From DHM v2.8.0 onward, the DHM Configuration Manager tries to make connection with the DHM Background Server by using Inter Application Communication or IAC. Therefore, it communicates with the I.E.-Proxy software. This software is a separate tool running as a

background process. (Refer to the user manual from the IE-PROXY). When for any reason communication cannot be established over IAC, it falls back on RPC or Remote Procedure Call and the following dialog will prompt:

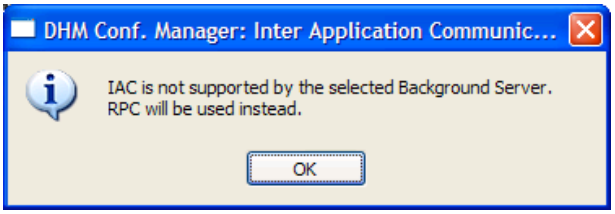

DHM Conf. Manager: Inter Application Communic...
IAC is not supported by the selected Background Server.
RPC will be used instead.
OK

Figure 4-11: RPC instead of IAC

If you select a remote DHM Background Server that is password protected, you will be asked for password authentication. Only when the correct password is given the DHM Configuration Manager will connect.

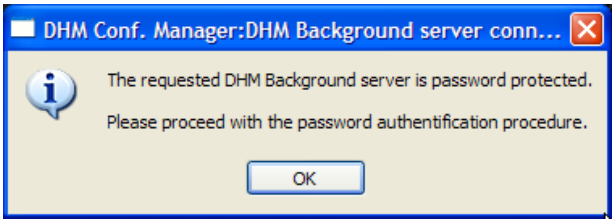

DHM Conf. Manager:DHM Background server conn...
The requested DHM Background server is password protected.
Please proceed with the password authentification procedure.
OK

Figure 4-12: Authentification notification

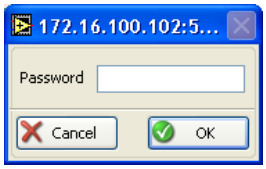


Figure 4-13: Password request

Once you are connected to a DHM Background Server, the session window will display all running sessions on the DHM Background Server and the connect button will be in the pressed status.

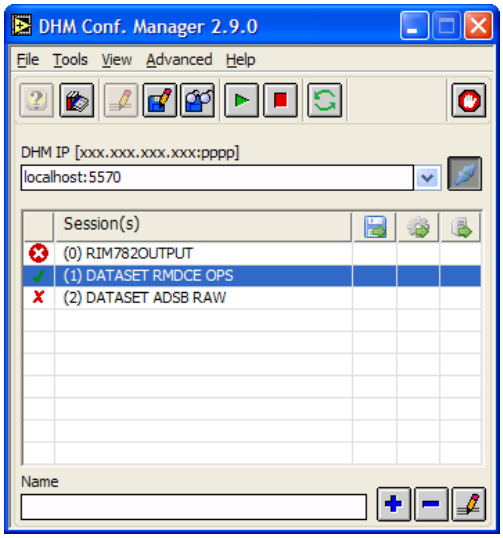


Figure 4-14: Connected to a DHM Background server

Another way of connecting to a DHM Background Server, is by typing its IP address in the "DHM IP" field: enter the IP address of the computer on which the background server is running followed by the port number of the DHM background server (default 5570) separated by a colon ":". If the background server is located on the same machine as the configuration module you may enter "localhost" instead of the machine's IP address. Though, it is easier to use the dropdown list which suggests the available DHM Background servers for you.

From DHM 2.9.0, the DHM Background Server also reports its version number to the DHM Configuration Manager. If the version number is unknown, you will see a small triangle left in the DHM IP field.

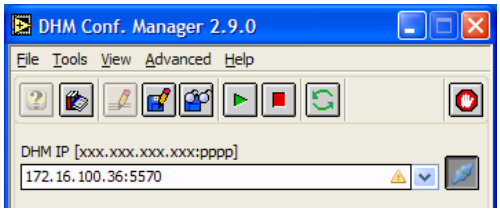


Figure 4-15: DHM Background Server version unknown

Three situations might occur:

- When you try to connect to a DHM Background Server that is not running at the moment (so it may appear in the list below the horizontal line when it was active in the past, see Figure 4-10), you will get the following error dialog:

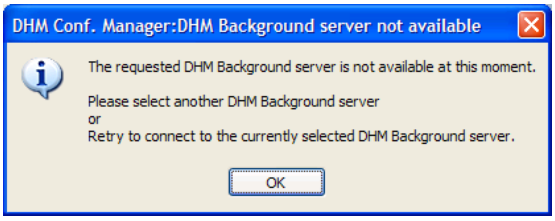

DHM Conf. Manager:DHM Background server not available
The requested DHM Background server is not available at this moment.
Please select another DHM Background server
or
Retry to connect to the currently selected DHM Background server.
OK

Figure 4-16: DHM Background server not available

It suggests retrying to make a connection or to select another DHM Background server.

- When you try to connect to another DHM server, you first have to disconnect from the actual connected DHM Background server. This can be done by pressing the again. When you do not do this, the following warning will appear:

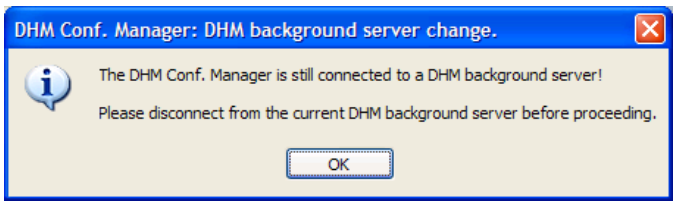

DHM Conf. Manager: DHM background server change.
The DHM Conf. Manager is still connected to a DHM background server!
Please disconnect from the current DHM background server before proceeding.
OK

Figure 4-17: Disconnect first!

- When you are connected to a DHM Background server and suddenly the connection is lost between the DHM Configuration Manager and the DHM Background Server. (for example the DHM Background Server crashed, the pc is shutdown or the network connection is lost), you will get the following warning:

DHM Conf. Manager: Refresh
[172.16.100.60:5570] is not available anymore. Please try to reconnect.
If the problem persists, verify the DHM background server.
OK

Figure 4-18: DHM Background server not available anymore

Multiple connections to the same DHM Background Server

It is also possible to connect with multiple DHM Configuration Managers to the same DHM Background server. It is even possible to open the session editor, but only 1 DHM Configuration Manager can edit a session at the same time! (See chapter 5 about Sessions)

4.2.3 Creating a session

A session is a separate configuration entity in the DHM. Multiple sessions may be configured and can run simultaneously. This approach gives flexibility in administrating the tasks of the DHM. Sessions can be stored and loaded and run independently of each other.
Enter a session name in the “Name” text box and press the “Add Session ” button.

Session names must be unique; you cannot use the same name for multiple sessions running on the same server. A maximum of 10 sessions can be loaded at the same time.

When the session is added its name appears in the “Sessions” list.

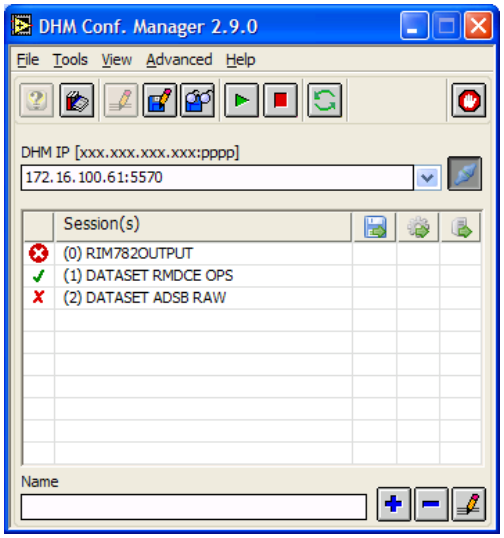


Figure 4-19: Sessions

A session can have 4 modes:

Table 4-3: Different session modes

Mode	Meaning
loading	A session is loading. When multiple sessions are selected to load at the same time, loading will be done one by one.
running	The session is running after having pressed the run button
stopped	The session is not running running after having pressed the stop button
error	There is an error in the session (for example the session contains a software module referring to a RIM782 but the hardware is not available anymore)

In “Chapter 5 Session editor”, you will see how to configure and monitor sessions by means of the “Session Editor”. This last window can be opened pressing the Edit button or just by double clicking on the session name.

Once a session is created, the DHM Background Server builds a separate executable for this session. This executable is only visible in Windows Task Manager. The different numbers, assigned to the executables, correspond to the numbers between ( ) before the session names. In the figure below, you see the following executables:

- YARDIOS_SESSION_ENGINE_0.exe:
  this corresponds to session (0) in the DHM Configuration Manager, which is named "RIM782OUTPUT"
- YARDIOS_SESSION_ENGINE_1.exe:
  this corresponds to session (1) in the DHM Configuration Manager, which is named "DATASET RMCDE OPS"
- YARDIOS_SESSION_ENGINE_2.exe:
  this corresponds to session (2) in the DHM Configuration Manager, which is named "DATASET ADSB RAW Digital"
- Further on you see the YARDIOS_SRV.exe (DHM Background Server) and the YARDIOS_SMGR.exe (DHM Configuration Manager)

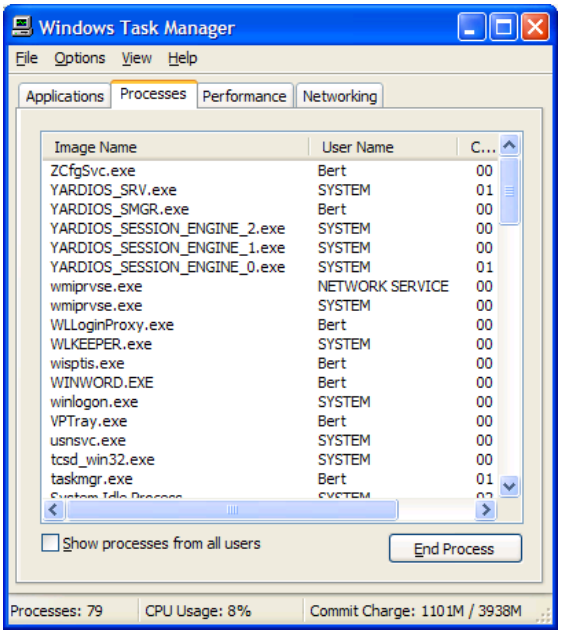


Figure 4-20: Sessions in task manager

When you are connected to a DHM Background Server on a remote pc, you have to open the task manager on that remote pc and not on the local pc where your DHM Configuration Manager is running on!

An advantage of sessions running as separate executables is the possibility to set them in auto load-start and persistent mode. (See paragraph 5.2.7) Using Windows Task Manager, it is also possible to set the processor affinity of a particular session. This can be done by right clicking on that session. For more information about this, refer to Windows help functions.

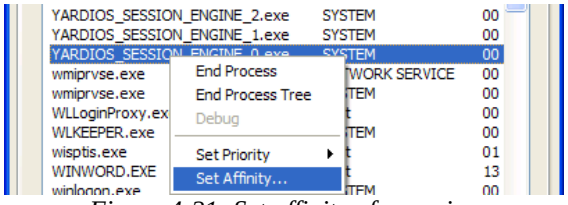


Figure 4-21: Set affinity of a session

4.2.4 Removing a session

Select the session which you wish to remove from the “Sessions” list and press the “Remove Session ” button. A session can only be removed when it is not running. If a session is still running, the following warning appears:

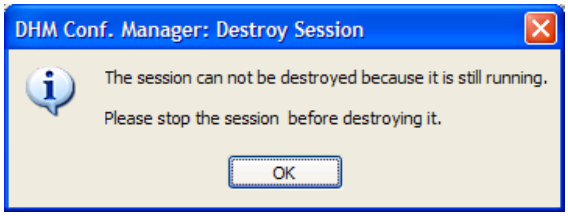

DHM Conf. Manager: Destroy Session
The session can not be destroyed because it is still running.
Please stop the session before destroying it.
OK

Figure 4-22: Destroy session

4.2.5 Saving a Session

To save a session first select its name from the “Sessions” list and then press the “Save Session” button or select “Save” from the “File” menu.
If you wish to save all the sessions in the “Sessions” list at once select “Save All” from the file menu.
If you wish to save a copy from a session with a different name, select “Save a Copy as” from the file menu.

Session configurations are stored as a *.ini-file on the computer where the DHM Background Server is running on. You can find them in the following path:

“C:\Program Files\Intersoft Electronics\RASS\RASS-R\YARDIOS_SRV\UserPrefs”.

The UserPrefs-folder with ini-files remains on disk when doing an un-installation of the DHM software, so that after a new installation you still have your sessions available.

4.2.6 Loading a Session

To load a previously stored session press the “Load Session” button or select “Open” from the “File” menu. The following dialog appears:

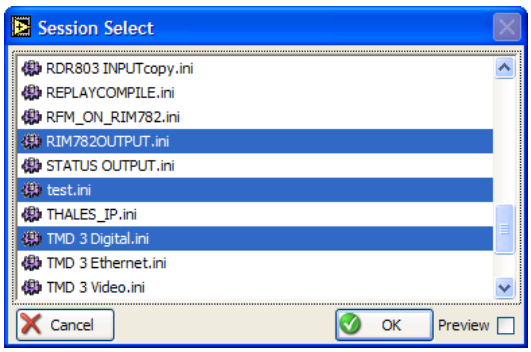


Figure 4-23: Session select

Select one or multiple sessions (by holding the Ctrl-key pressed) name(s) and press “OK” or double-click the session name.

The Session Select window also has the possibility to have a preview of the session configuration. This can be enabled by selecting the Preview check box. A window at the right will appear, with possibilities to zoom in/out.

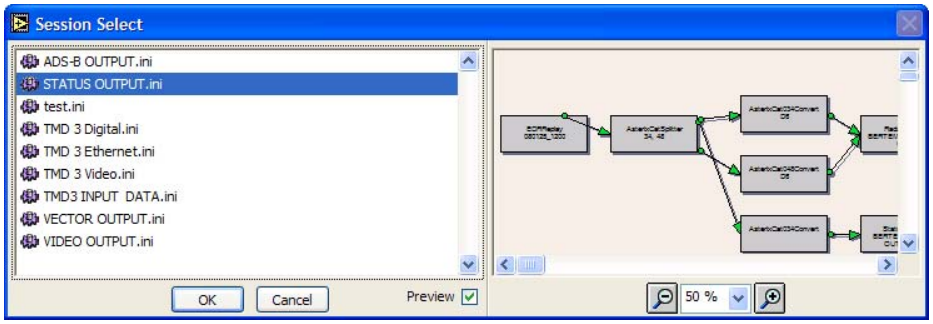


Figure 4-24: Session select with preview

4.2.7 View functions

4.2.7.1 Module list

The “Module List” can be opened via the Menu bar: click View, ↳ Module list or press Ctrl+L. The module list shows all available DHM modules for a particular DHM Background Server (see IP address in the title bar). The different modules are explained in chapter 6.
The module list is convenient to check which Intersoft Electronics hardware devices are connected to the computer or to see which DHM modules are installed. (It is recommended to do a Rescan Modules first when new hardware devices are connected after startup of the DHM Background server. (See paragraph 4.2.7.2)

In the figure below, you see that a RIM782 is connected to a DHM Background Server running on a pc with IP address 192.168.0.118:5570.

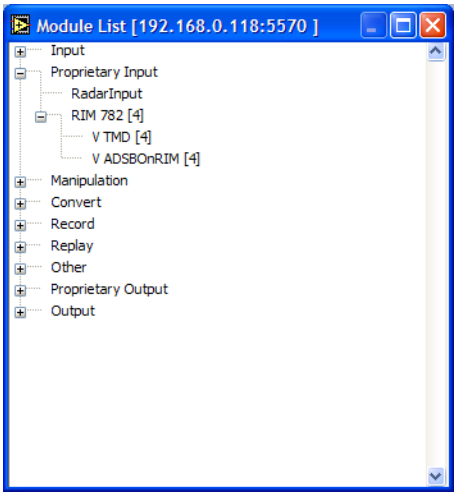


Figure 4-25: Module list

The Module List is only available when you are connected to a DHM Background Server!

4.2.7.2 IP network related functions

When multiple DHM Background Servers are working together in a network, with different DHM Configuration Managers on computers with multiple network interfaces and IP addresses, it might be convenient to use these tools to check your IP configuration and statistics.

Take care: The IP configuration corresponds to the pc with the DHM Background Server where you are connected to!
Suppose that you are working on a workstation with a connection to a server; you can use the DHM Configuration Manager to make a connection to the DHM Background Server and then view the different network cards that are active on that server!

When you click in the Menu bar, View ↳ IP ↳ IP Configuration, you will see the following result:

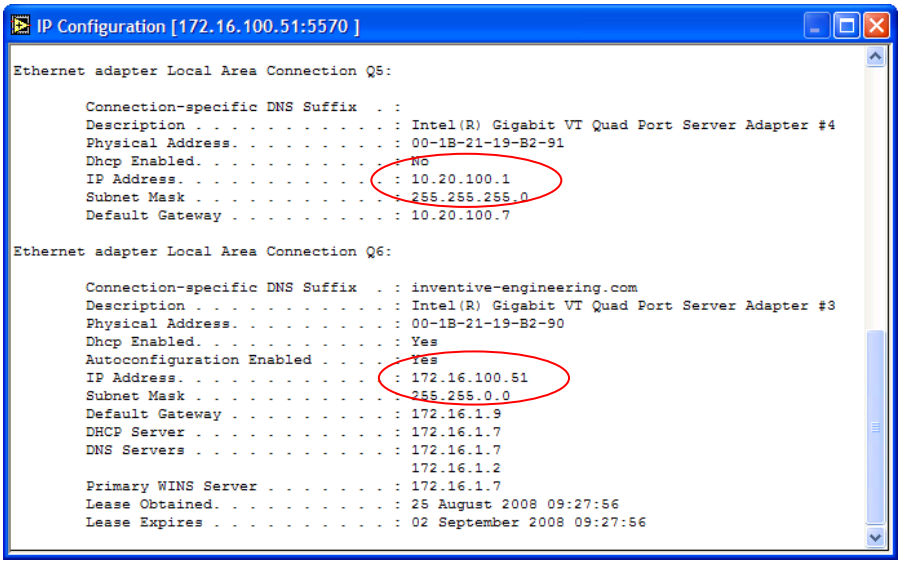

IP Configuration [172.16.100.51:5570]
Ethernet adapter Local Area Connection Q5:
Connection-specific DNS Suffix . :
Description . . . . . : Intel(R) Gigabit VT Quad Port Server Adapter #4
Physical Address. . . . . : 00-1B-21-19-B2-91
Dhcp Enabled. . . . . : No
IP Address. . . . . : 10.20.100.1
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 10.20.100.7
Ethernet adapter Local Area Connection Q6:
Connection-specific DNS Suffix . : inventive-engineering.com
Description . . . . . : Intel(R) Gigabit VT Quad Port Server Adapter #3
Physical Address. . . . . : 00-1B-21-19-B2-90
Dhcp Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
IP Address. . . . . : 172.16.100.51
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . : 172.16.1.9
DHCP Server . . . . . : 172.16.1.7
DNS Servers . . . . . : 172.16.1.7
172.16.1.2
Primary WINS Server . . . . . : 172.16.1.7
Lease Obtained. . . . . : 25 August 2008 09:27:56
Lease Expires . . . . . : 02 September 2008 09:27:56

Figure 4-26: IP Configuration

The result is the same as after an “ipconfig /all” command in the DOS-prompt. You can see that this computer has multiple Ethernet ports (probably a server),
one with address 10.20.100.1, subnet 255.255.255.0
and another with 172.16.100.51, subnet 255.255.0.0

When you click in the Menu bar, View ↳ IP ↳ Statistics, you will see the following result:

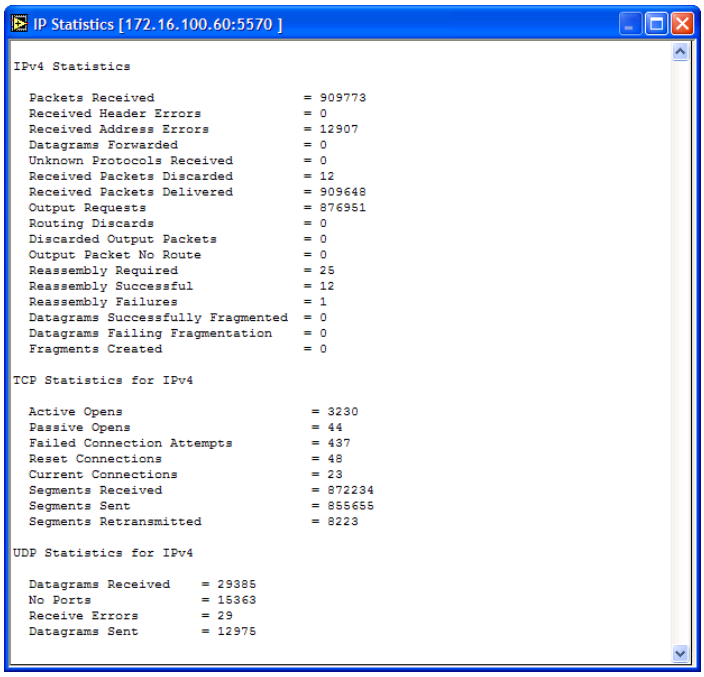

IP Statistics [172.16.100.60:5570]
IPv4 Statistics
Packets Received = 909773
Received Header Errors = 0
Received Address Errors = 12907
Datagrams Forwarded = 0
Unknown Protocols Received = 0
Received Packets Discarded = 12
Received Packets Delivered = 909648
Output Requests = 876951
Routing Discards = 0
Discarded Output Packets = 0
Output Packet No Route = 0
Reassembly Required = 25
Reassembly Successful = 12
Reassembly Failures = 1
Datagrams Successfully Fragmented = 0
Datagrams Failing Fragmentation = 0
Fragments Created = 0
TCP Statistics for IPv4
Active Opens = 3230
Passive Opens = 44
Failed Connection Attempts = 437
Reset Connections = 48
Current Connections = 23
Segments Received = 872234
Segments Sent = 855655
Segments Retransmitted = 8223
UDP Statistics for IPv4
Datagrams Received = 29385
No Ports = 15363
Receive Errors = 29
Datagrams Sent = 12975

Figure 4-27: IP Statistics

The result is similar as after a “netstat -s” command in the DOS-prompt.

When you click in the Menu bar, View ↳ IP ↳ Addresses, you will see the following result:

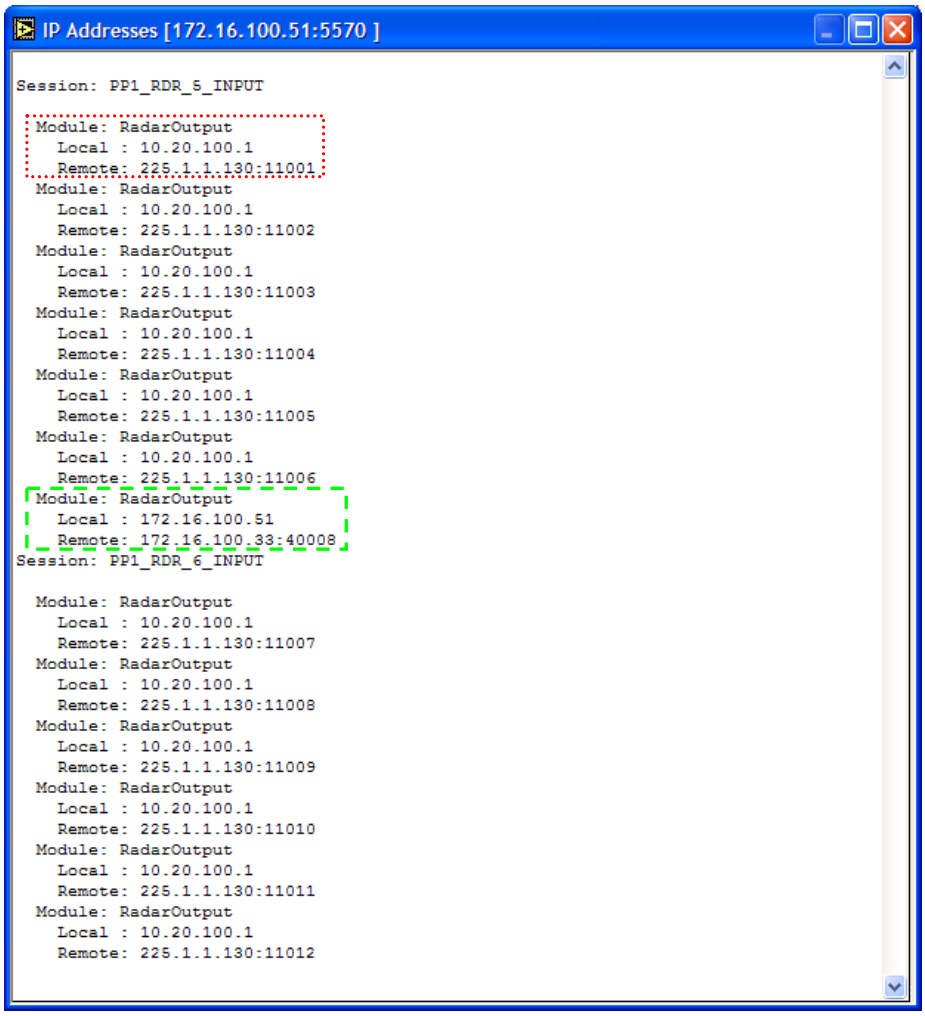


Figure 4-28: IP Addresses result

This window shows all IP addresses that are used in the sessions (PP1_RDR_5_INPUT and PP1_RDR_6_INPUT) loaded on this DHM Background server. Remark again that 2 physically different Ethernet ports are used in session PP1_RDR_5_INPUT:
RadarOutput (dotted line): outputs data to a MRD3 on Ethernet port 10.20.100.1
RadarOutput (dashed line): outputs data to a MRD3 on Ethernet port 172.16.100.51

This explains the meaning of Local and Remote IP Address, which comes back several times in chapter 6!

All IP functionalities require that IAC is supported by running the Intersoft Proxy Agent. They are only available when you are connected to a DHM Background Server. (Because the information comes from the DHM Background Server computer ofcourse!)

4.2.8 Advanced functions

4.2.8.1 Rescan modules

The “Rescan Modules” can be opened via the Menu bar: click Advanced, ↳ Rescan Modules, by presssing Ctrl+R or by clicking the rescan button .
The DHM Background Server checks all connected hardware to the computer at start up phase. Since the DHM Background Server is registered as a Windows service, this check is done when Windows is started. When new hardware (e.g. a RIM782. RDR803 or UDR600) is connected to the pc after the DHM Background Server has started, it is necessary to “rescan the modules”. Rescanning makes that the connected hardware becomes available as software component in the session editor.

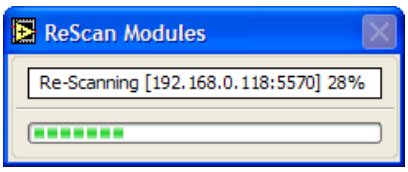


Figure 4-29: Rescan dialog

The Rescan Modules is only available when you are connected to a DHM Background server and when the session editor is closed!

Suppose you have the session editor open (See chapter 5), you will get the following error dialog:

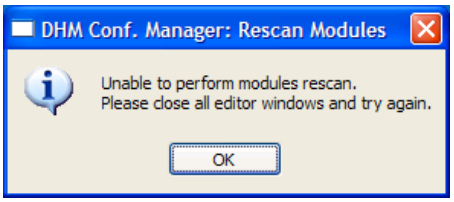


Figure 4-30: Close session editor before rescan of modules

4.2.8.2 Manage USB Devices

This function is still under development. This chapter will be updated in the next release.

The “Manage USB Devices” can be opened via the Menu bar: click Advanced, ↳ Manage USB Devices or by presssing Ctrl+U. (Black dots means that these devices are connected to the pc)

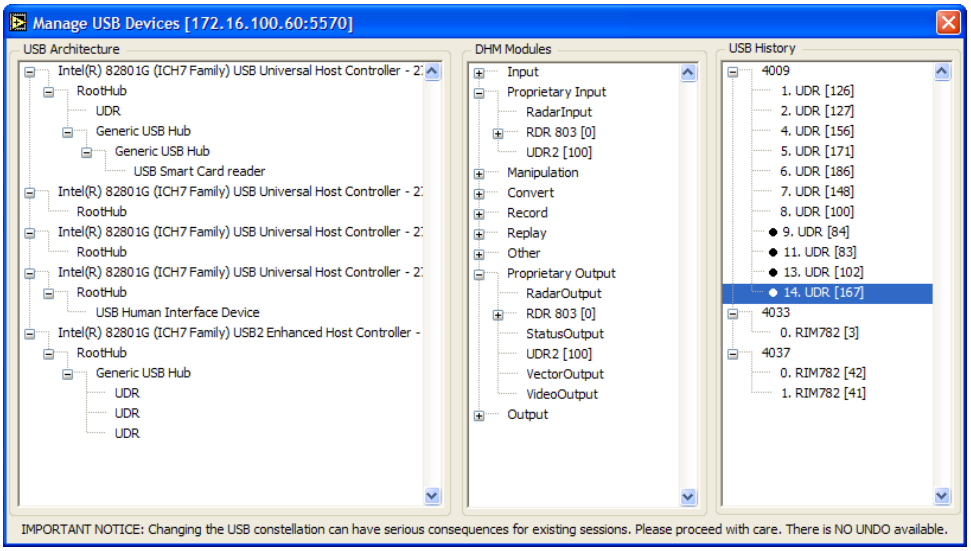


Figure 4-31: Manage USB Devices

For the computer where the DHM Background Server is running on:

- in the left pane you see the architecture of all USB devices.
- in the middle, you can see which USB devices are connected to your DHM Background Server. (if any)
- In the USB History, you see the link between the USB device serial number (between square brackets [xxx]) and the logical numbers. Important to know is that hardware in a DHM session is identified with its logical number!

Let’s explain with an example:
You have created a DHM session with the UDR[100]. According to the USB Devices window, this corresponds to logical number 8. This corresponds to the value in the ini-file from the session:
In the following path: **`C:\Program Files\Intersoft Electronics\RASS\RASS-R\YARDIOS_SRV\UserPrefs`**, you find the session file, for example UDRINPUT.ini, that contains the following line (Notepad): **`Configuration.UDR Params.LogicalNbr=8`**

Now you want that UDR[83] corresponds to this UDRINPUT-session, without changing the session. Then follow the next steps:

First of all you stop the UDRINPUT-session. Then you right click on the UDR you want to change, choose Exchange “8.UDR[100]” with for example 11.UDR[83]

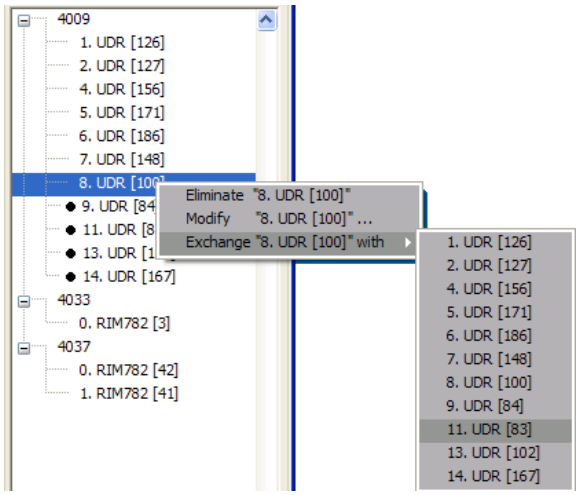


Figure 4-32: Exchange an USB device

By pressing F5, the USB Discover window will refresh.

The Manage USB Devices function requires that IAC is supported by running the Intersoft Proxy Agent. The Manage USB Devices is only available when you are connected to a DHM Background server!

4.2.8.3 DHM Discover

The “DHM Discover” can be opened via the Menu bar: click Advanced, ↳ DHM Discover. The following window appears:

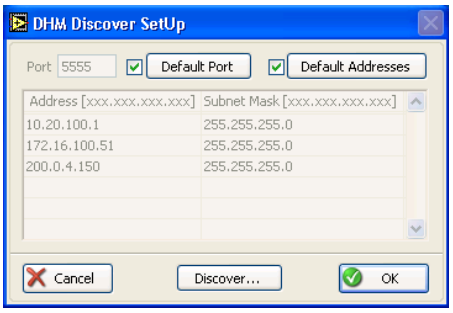


Figure 4-33: DHM Discover (first)

It automatically scans all active Ethernet ports on your computer where the DHM Configuration Manager is running on! In the figure above, there are 3 Ethernet ports with the given IP addresses. (So this example is from a server)
If you want to scan for DHM Background servers on another port or another subnet, disable “Default Port” and “Default Address” and type the correct port number or subnet. If you do not want that the DHM Conf. Manager looks on the 200.0.4.150 network, you simply delete this address and press OK.

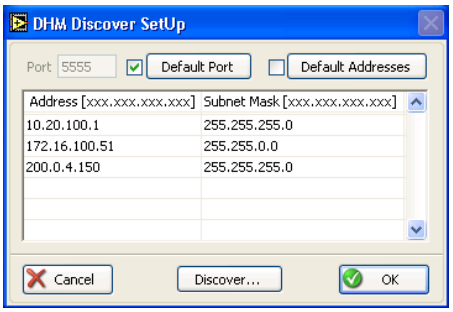


Figure 4-34: DHM Discover

Even if the subnet mask is correctly configured in your network settings, this DHM Discover Setup sets 255.255.255.0 for the subnet and you have to change it manually if necessary. (For example 255.255.0.0 for IP 172.16.100.51)

When making a mistake, you will see the following dialog:

DHM Conf. Manager: DHM Discover
Every IP address needs a corresponding subnet mask.
Please re-edit the DHM discover setup.
OK

Or in case of any trouble, you will see:

Finally, after pressing Discover, the DHM Configuration Manager sends a DHM Discover message over all network interfaces as configured. The result can be:

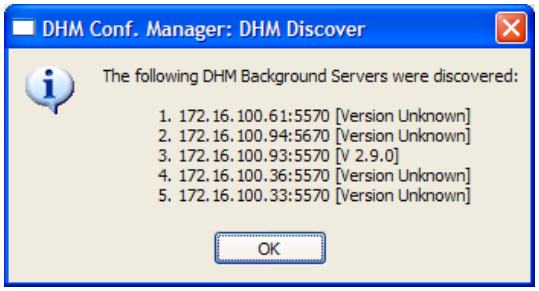

DHM Conf. Manager: DHM Discover
The following DHM Background Servers were discovered:
1. 172.16.100.61:5570 [Version Unknown]
2. 172.16.100.94:5670 [Version Unknown]
3. 172.16.100.93:5570 [V 2.9.0]
4. 172.16.100.36:5570 [Version Unknown]
5. 172.16.100.33:5570 [Version Unknown]
OK

Figure 4-35: DHM Discover result

As you can see in the figure above, from DHM 2.9.0 onward also the version number is sent in a data packet. (See also Figure 4-15: DHM Background Server version unknown)

The IP addresses from the discovered DHM Background servers will now be saved until you choose Advanced, ↳ Clear DHM IP Discover.
They also appear in the dropdown list as in Figure 4-10: DHM server list. (Though this dropdown list also shows DHM Background Servers that were active in the past but where you did not receive a DHM response from!)

The DHM Discover function corresponds to the DHM Configuration Manager computer. Therefore, this function can be used when you are not connected to a DHM Background Server; this in contrast with for example the IP functions!

When you changed the IP settings of the computer where the DHM Configuration Manager is running on, you need to restart the computer! Only after restart, the DHM Configuration Manager will recognize the new IP settings and can correctly discover other DHM servers!

5 Session editor

To edit, configure and check session, you need to take a look in their configuration. This can be done using the “session editor”.

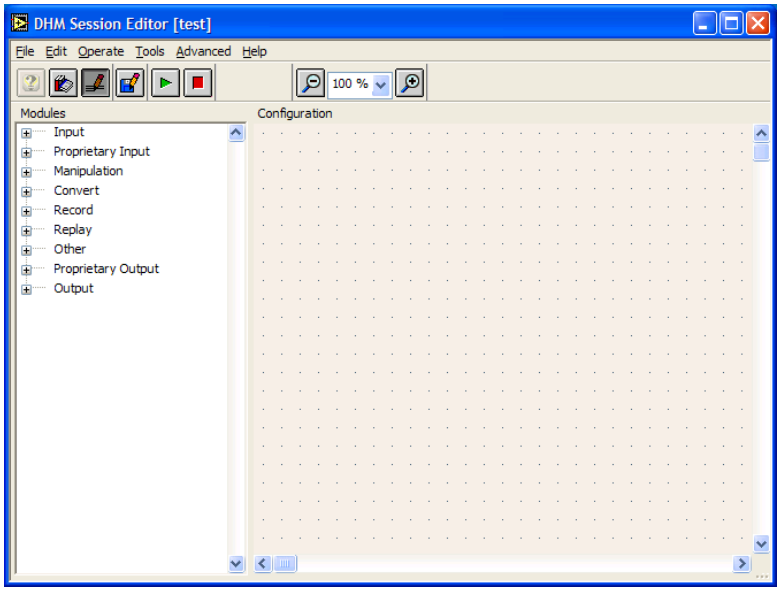


Figure 5-1: Session configuration editor in edit mode

The session editor operates in two modes:

- Run mode: start, stop and monitor sessions. (Module list not visible)
- Edit mode: add, remove and configure the software components in a session. (Module list visible)

Switch between the two modes by clicking or by using the menu.

Multiple connections:
it is also possible to connect with multiple DHM Configuration Managers to the same DHM Background server. It is even possible to open the session editor, but only 1 DHM Configuration Manager can edit a session at the same time! When a session is for example in edit mode in another DHM Configuration Manager, it is locked and you will see the following warning:

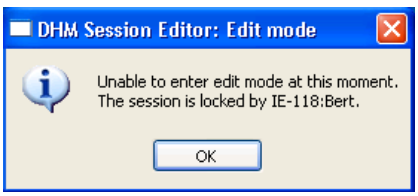


Figure 5-2: Session locked

The next paragraphs explain how to work in the “session editor”.

5.1 User interface

5.1.1 File menu

An overview of all available menu items is given in the table below.

Table 5-1: File menu

Menu	Usage
File	
↳ Close (Ctrl+W)	Close a session
↳ Save (Ctrl+S)	Save a session
↳ Save a copy as	Save a copy of a session with a different name
Edit	
↳ Cut (Ctrl+X)	Cut a module (Delete)
↳ Copy (Ctrl+C)	Copy a module
↳ Paste (Ctrl+V)	Paste a module
Operate	
↳ Start all	Start all modules in the current session
↳ Stop all	Stop all modules in the current session
↳ Change to run mode/edit mode (Ctrl+M) mode	Change to other mode
Tools	Under development
Advanced	
↳ Autoload	Set a session in Autoload mode
↳ Autorun	Set a session in Autorun mode
↳ Persistent	Set a session in Persistent mode
↳ Expert	
↳ Sanity check	Open the session sanity check
Help	
↳ About	Display version information

5.1.2 Buttons

An overview of all available buttons is given in the table below.

Table 5-2: Different buttons

Button	Usage
Manual	Load User Manual
Edit	Change to edit mode
Save	Save the current session
Start	Start a session
Stop	Stop a session
Zoom out	Zoom out the editing pane
Scale	Zoom in/out by selecting a scale factor
Zoom in	Zoom in the editing pane

5.2 Configuration

5.2.1 Adding and removing a software component

Software components are the building blocks of the DHM, they have specific functions like input (capture data), output (storage on disk, broadcast on LAN …), and manipulation (convert data, strip transport layer …). By connecting different software components together you can build a DHM session to provide simple or complex functionality.

In edit mode there is a “Modules” selection list on the left side of the window from where you may select software components to build a session. Select a component from the list and double-click it to add it to the configuration window. If you wish to remove a component from the configuration select it in the configuration window and press the “Delete” key on your keyboard. You may move the components around in the configuration window simply by dragging them with the mouse.

A typical configuration consists of several components: input, processing and output, as in the example below.

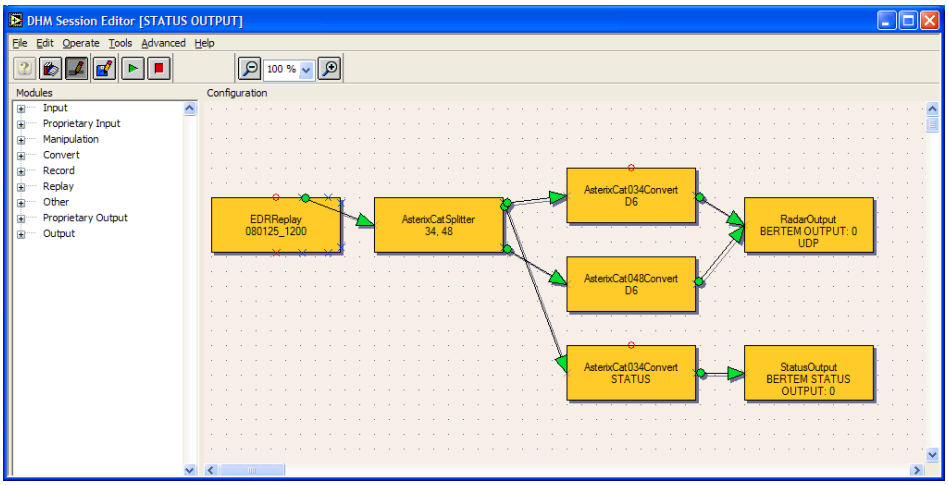


Figure 5-3: Session example

The modules in the list correspond to the Module List window as described in paragraph “4.2.7.1”.

Caution: Never delete more than 20 modules at once as this will cause a session crash and unsaved modifications will be lost.

5.2.2 Connecting software components

The components are wired together by arrows drawn from one component's output to another component's input.
A sample session under construction is shown here:

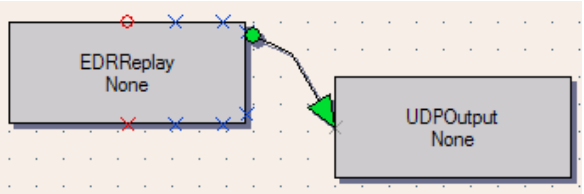


Figure 5-4: Software components detail

Notice the different connection "anchors" on the software components, outputs are depicted with a blue X, inputs are depicted with a grey X, event connections are depicted with a red O (North/Sector Message) or red X (ACP/ARP/PPS).

You can draw arrows between outputs and inputs by moving the cursor over the blue X until it changes into a "hand" icon, click and hold the left mouse button while dragging the cursor towards the grey X to which you wish to connect the output.

If no arrow can be drawn, this means that the input from the arrow has a wrong data format for the output you wish to connect to.

Take into account the following rules: an output must be connected to an input, and X to an X, an O to an O.

When correctly positioned over the grey X, release the mouse button. If you wish to remove a connection select the arrow in the configuration window and press the "Delete" key on your keyboard.

5.2.3 Configuring a software component

Double-click the component in the module to open the component specific configuration window. A detailed description of each software component is provided in chapter 6.

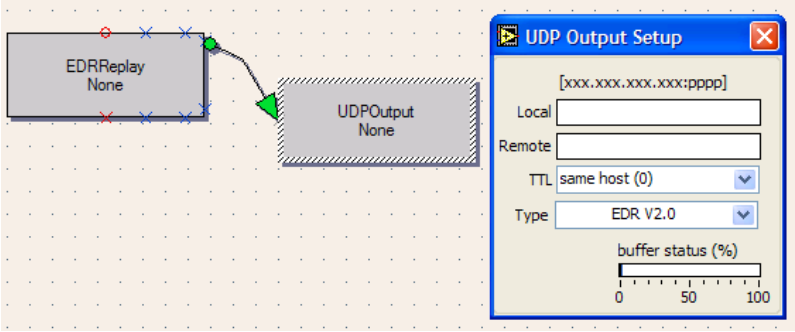


Figure 5-5: Configuring a software component

5.2.4 Rearranging objects

You may rearrange objects such as software components and arrows when the session configuration window is set in edit mode.

5.2.4.1 Moving/Modifying software components

Software Components are depicted by rectangles; you can edit the rectangles by first selecting them. Select the object by moving the cursor to the centre of the object and then clicking the (left) mouse button. Selected components are marked by a hash frame. You can now drag the object around the diagram. When multiple modules are selected, they can be moved simultaneously only with the mouse and not with the keyboard.

5.2.4.2 Moving/Modifying connecting arrows

Arrows can be selected by moving the cursor to the arrow and then clicking the (left) mouse button. A selected arrow has white selection points which you may drag around to adjust the position of the arrow. By right click on the arrow you also have the possibility to add/remove a segment, choose an arrow style or open a Probe (See 5.2.6).

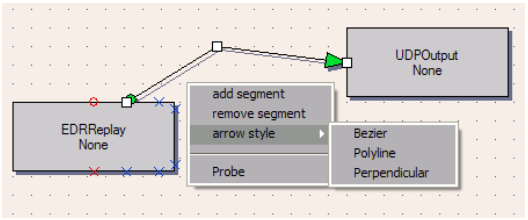


Figure 5-6: Moving and modifying connecting arrows

5.2.4.3 Copy/Paste/Cut software components

After selecting one or multiple software components, you can easily perform the following functions: Copy (CTRL+C), Paste (CTRL+V) and Cut (CTRL+X).

Copy and Paste is not possible with a hardware module because a unique hardware device is addressed!

5.2.5 Running

Running a configured session is done by pressing the “Start ” button or by selecting “Start All” from the “Operate” menu. Running software components are colored green in the session configuration window. When colored yellow, this means that the software component is in idle state. It is waiting for a next module to connect to its output; then it turns green.
In the example below, the RadarOutput module is yellow, as well as the AsterixCat001Convert. As soon as the MRD3 connects as a client to this RadarOutput module (see also 6.58) it becomes green. Consequently, the preceding module AsterixCat001Convert will also turn green.
Other software modules as for example the UDPOutput or any recorder, always request data and therefore will not be green immediately.

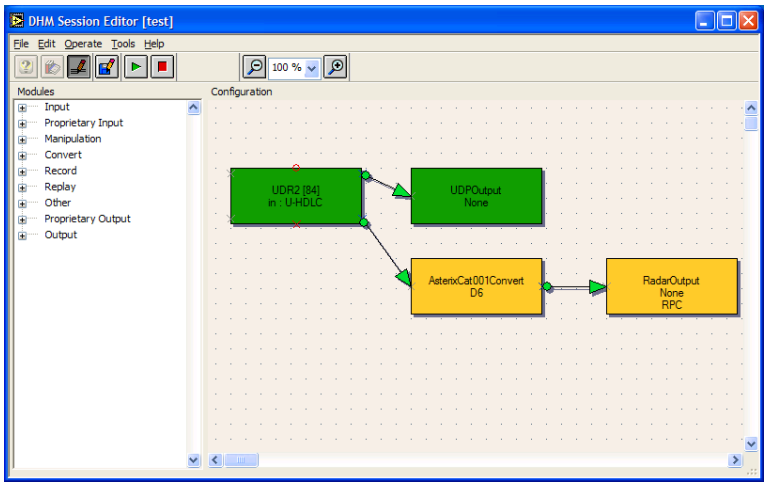


Figure 5-7: Example session running

Stopping a configured session is done by pressing the “Stop ” button or by selecting “Stop All” from the “Operate” menu. Stopped software components are colored grey in the session configuration window.

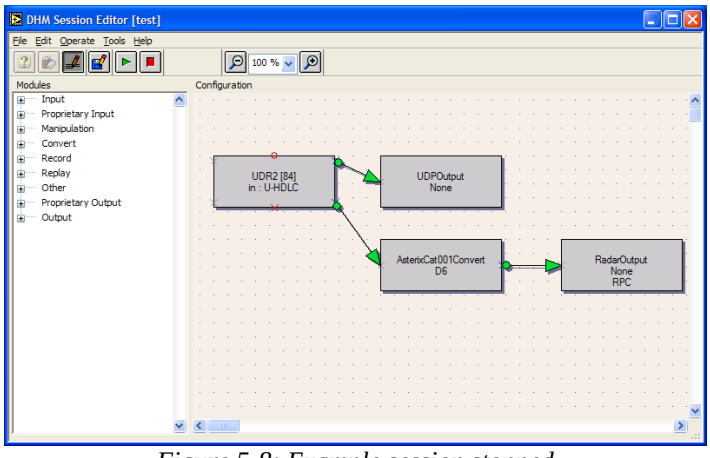


Figure 5-8: Example session stopped

If the session configuration editor is in “Edit” mode you may start/stop **individual** software components by right-clicking on the component and subsequently selecting “Start” or “Stop” from the pop-up menu. Referring to Figure 5-7 above, you can forcefully start the AsterixCat001Convert and RadarOuput module by clicking Start on them individually. (and without the MRD3 actually being connected!)

Pressing “Status” will open a status window from the selected module.

By clicking “Delete” you have the following options:

- Delete the module
- Delete the input connections
- Delete the output connections
- Delete all connections (i.e. input and output)

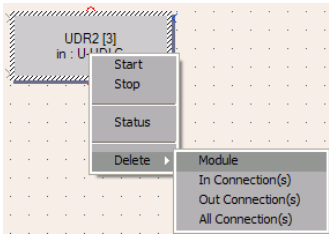


Figure 5-9: Right click on module

Example of a status window that shows useful information about a software component. If no status window is implemented, a warning will appear.

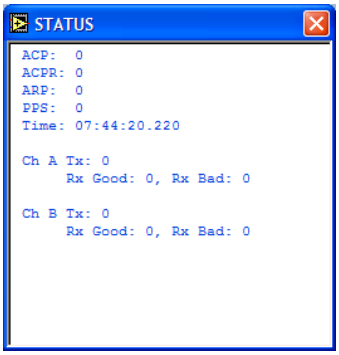


Figure 5-10: Example of status window (UDR)

The different status windows are explained in chapter 6 Software components.

When after loading a session, a software module becomes red, this indicates an error. You cannot run the session correctly upon resolving the problem. An error will also be visible in the sanity check. (See 5.2.8)
An error can for example occur in the following situation: you load a session where you previously configured a hardware module in (for example a UDR600). But now this UDR600 is not connected to the computer anymore. Then, the DHM Background Server cannot communicate with this hardware module and will result in an error!

Figure 5-11: Module not available

5.2.6 Inspecting a running session

You may inspect the output of software components by right-clicking on an arrow (see Figure 5-6) leading from the output to a next module's input and selecting "Probe" from the pop-up menu. A floating window appears:

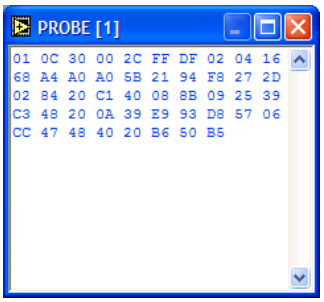


Figure 5-12: Output data probe

Depending on the content of the output, different kinds of probes are available: D6 probe, text probe, an event probe or just a normal probe. The matching probe will be launched automatically by the software. The data in the probe is presented in an appropriate manner according to the type of probe. It is possible to open multiple probes. They will be enumerated starting from [0].

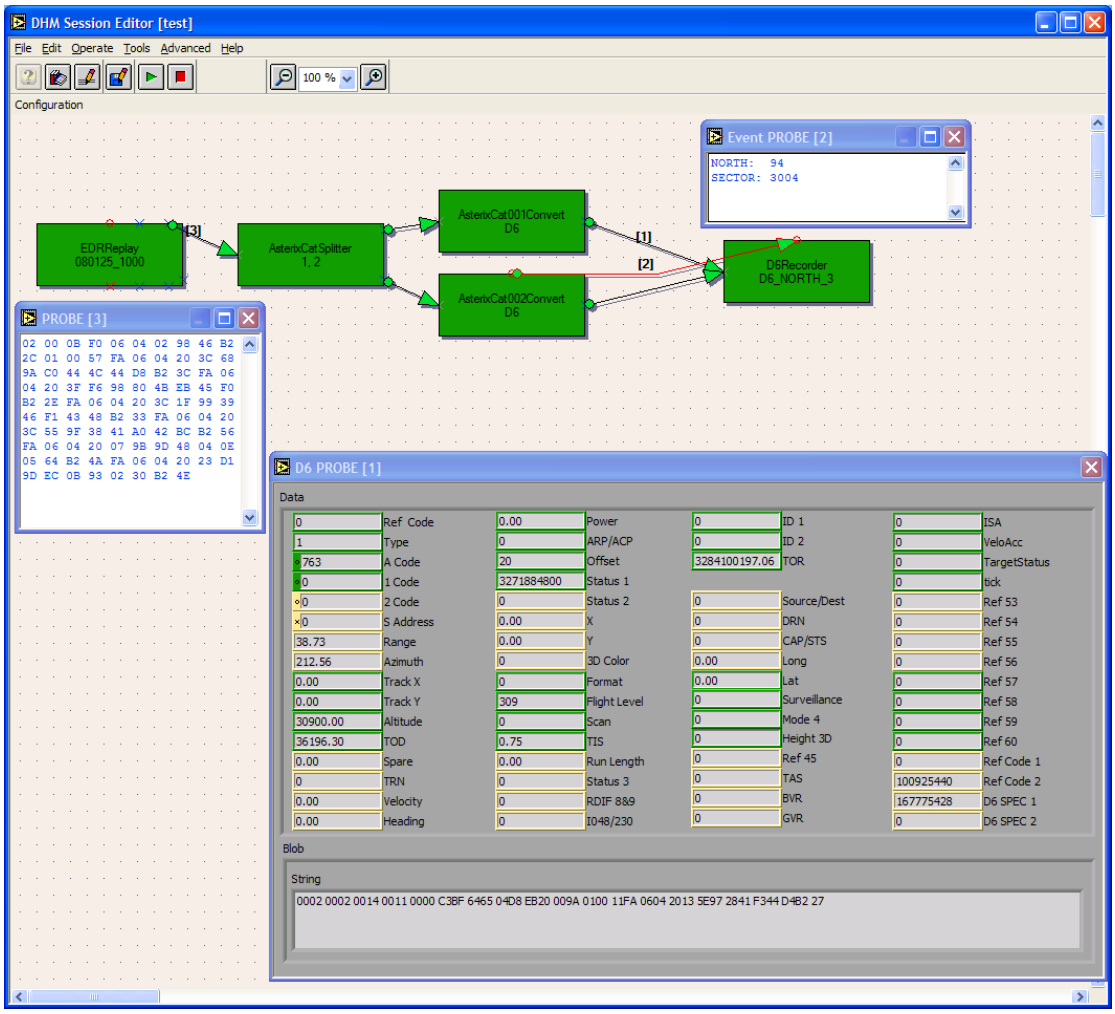
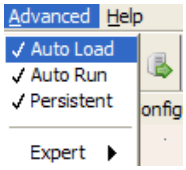


Figure 5-13: Multiple probes opened

5.2.7 Advanced session modes

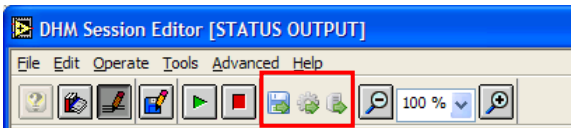
In the Advanced menu, you have the possibility to enable 3 modes for a session:



They have the following meaning:

- Auto Load : If active, the session is automatically loaded when the DHM Background server starts.
- Auto Run : If active, the session starts automatically on the condition that the session is also loaded. (Which can be done manually or via the auto load mode)
- Persistent : When the sessions disappeared after a crash, it reloads again and starts automatically.

Finally, you will see the 3 symbols appear in the DHM Session Editor:



The different modes will also be visible in the DHM Conf. Manager window:

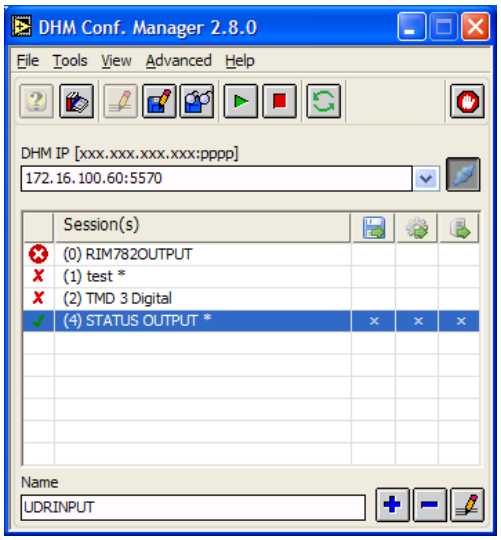


Figure 5-14: Different session modes

Auto Run and Persistent can only be enabled once a session has been saved at least once as these parameters are set in the session's ini-file while the Auto Load setting is a parameter in windows registry!

5.2.8 Sanity check

By clicking “Sanity Check” in the Advanced menu ↳ Expert, the following window opens:

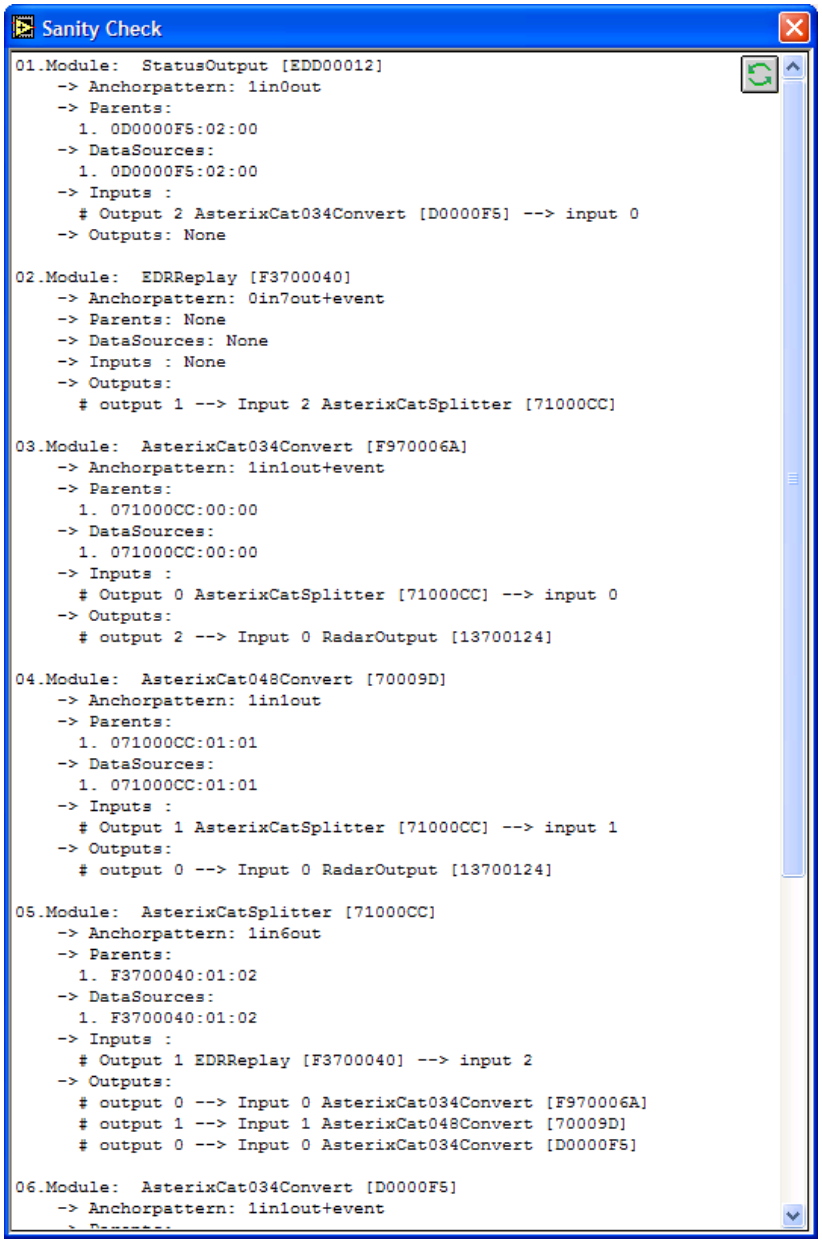


Figure 5-15: Sanity check

It is a text version of the graphical representation of a session and can be used for advanced debugging purposes only.

6 Software components

This chapter provides a detailed overview of all the available software components in alphabetical order.

First read this section before reading the different software modules!

Software component blocks that correspond to hardware, will only appear in the module list when the hardware is connected to the pc running the DHM Background Server! Remember that by pressing the rescan button (refer to 4.2.8.1 Rescan modules), you can display hardware that was connected to the pc **after the start of the DHM server**. (Refer to 3 DHM Background Server).
Intersoft Electronics' hardware will be listed in the Proprietary Input and Output field. In the left figure below, no hardware is connected. In the right figure, a RDR803, RIM782 and UDR600 are connected to the pc running the DHM server. Some of these devices can work both as input or output, depending on the configuration in the DHM session. Through further developments of RASS-R hardware, new modules will become available at new software releases, for example the UVR892.

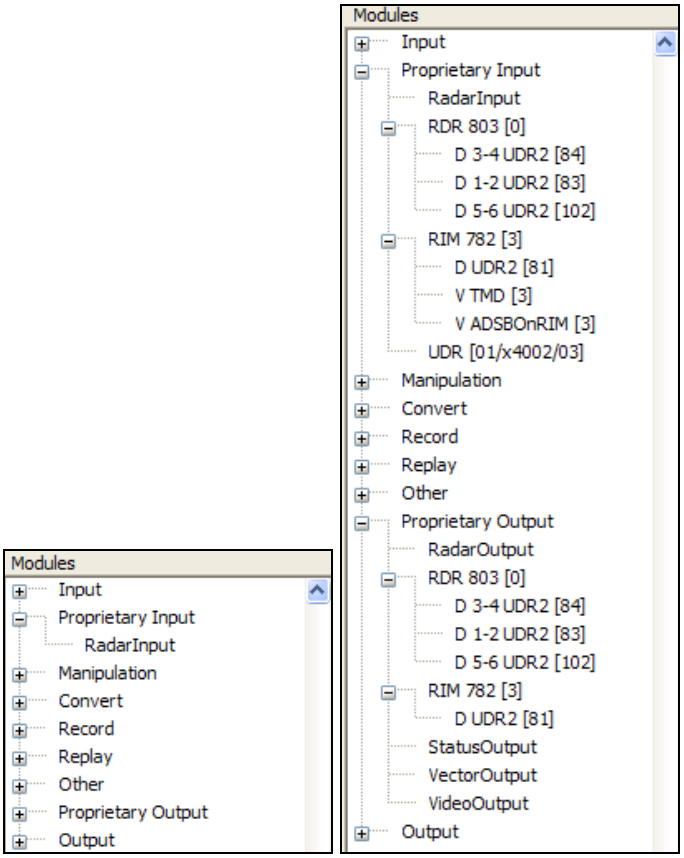


Figure 6-1: No hardware to input connected versus hardware connected

Before you start reading the software components:
In this chapter, the software components are in alphabetical order. However, in the module list in the DHM Session Editor, they are grouped together according to their function. The different categories are listed in the figures above. (for example: input, manipulation etc.)

Intersoft internal data formats:
The DHM converts data always to an internal data format. The following Intersoft proprietary formats are available:

- D6: RASS-R file data format (*.D6), to be used in TMD3, MRD3, TRACKAN and RCM/D
- S4: RASS-S file data format (*.S4), but also to be used in RCM/D
- Text: to see the input data in a text format (*.txt), for example to be viewed with Notepad
- Replay: format to be used in combination with the Data Replay tool
- IRD: Interrogation Reply data format (Currently only implemented in the ADS-B module and to be viewed in RASS-S with the Interrogation Reply viewer) [Reference 2]
- EDR V2: standard data format as being input or output by an UDR600, RDR803 or RIM782 (serial channels) [Reference 2]
- Vector: data format to describe vectorized data (for example weather data to MRD3)
- Status: data format to describe status messages data (for example status messages to MRD3)
- Video: data format to describe video data, for example input from the RIM782 and sent to the MRD3.

How to choose between a D6-recording and an EDR-recording?
An EDR recording is recommended when you want to make long time recordings on disk of your data (For example 30 days). Advantage is that the raw data with all information is recorded. No RASS-R software program can directly input EDR data, except the (Advanced) File Merger in the DHM (See chapter 7)! A D6 recording is recommended when you want for example input the D6 chunks of data into the TRACKAN software. D6-files are bigger than EDR-files, so not recommended for long time storage. It also does not contain the raw data as received through for example the UDR600, because the data already went to D6 convert modules.
From an EDR-file, you can always make a D6-file and a S4-file. From a D6-file, you can only make an EDR-file with the D6toCAT034/048 module.

Local versus Remote IP address:
Every time that an input or output over Ethernet network must be configured, you have the local and remote IP address to fill in. Local IP must only be filled in when the pc has multiple Ethernet ports. In this way, you tell the DHM through which physical Ethernet port it has to input or output data.
In the case that there is only one Ethernet port on the computer, you never have to fill in the local IP address. A practical example can be seen in “Figure 4-28: IP Addresses result”.

IP addresses:
Whenever you have to type an IP address, it must be in the following form:
[xxx.xxx.xxx.xxx]:[ppppp].
A check will be performed on the validity of IP address and maximum port number, with the following dialog if wrong:

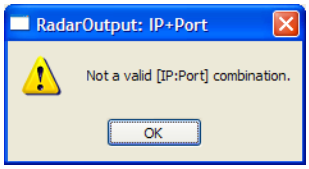


Figure 6-2: Invalid IP

Default network protocol:
By default and when applicable, all modules will have UDP as default transport protocol.

Modules to MRD3:
The following modules can be used to connect to a MRD3: RadarOutput, VectorOutput, StatusOutput and VideoOutput. Because more MRD3's can be connected to these output types, you will see the number of connected MRD3's in these modules!

Data for TMD3:
You cannot send D6 data to the TMD3. The TMD3 has an own engine that converts ASTERIXCat001/002/008/034/048 and RDIF to D6. So these actions do not need to be done by a DHM session. To send data to a TMD3, choose an UDPOutput module set to output type "EDR V2.0 incl. header"!

Sensor coordinates:
Data protocols that only contain position in Lon/Lat (for example ASTERIXCat021), have a tab to fill in sensor coordinates. This makes it possible to calculate the X/Y or Ra/Az position in the D6 data, in order to process it in the TRACKAN software!

Drag and drop folder paths for recording and replay modules:
All recording and replay software modules require a **path to a folder**. Path selection cannot be made by a standard Windows dialog. You should drag and drop the path from Windows explorer to the Destination Path in the software module setup. Upon release of the mouse, a shaded border appears as in the figure below.

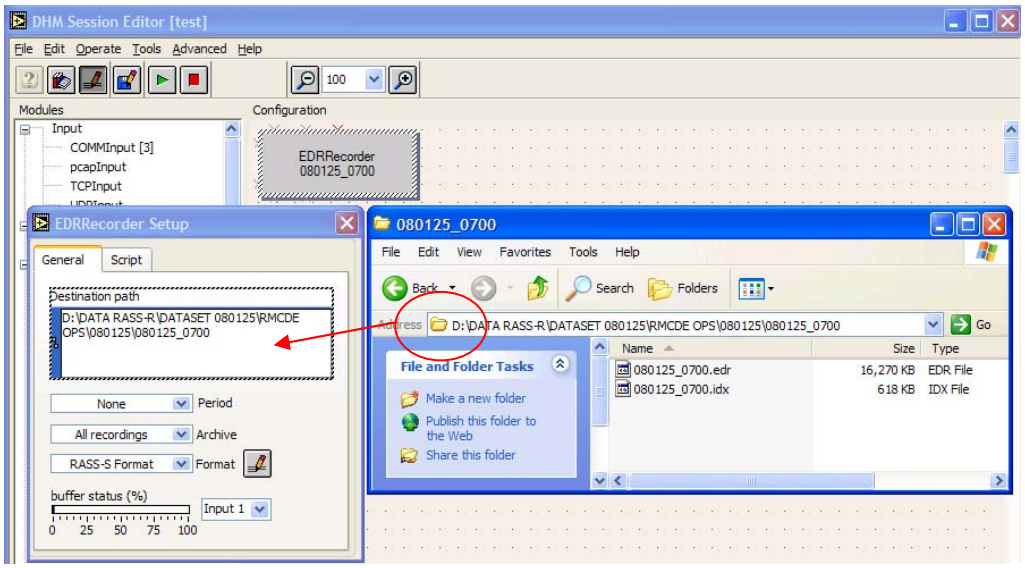


Figure 6-3: Drag and drop

Dragging and dropping between a processing pc (where the DHM Background Server runs on) and a monitoring pc (where the DHM Configuration Manager runs on) is not possible. In this case, you have to copy and paste the path!
Alternatively for recording modules, you can also type a path. If the path does not exist yet, a folder will be created.

Time Stamping:

The DHM always uses the PC time to timestamp each received data package with a **time of recording** (TOR). In order to accurate measure the processing delay of the radar; the TOR field has to be set in the EDR or D6 format as soon as possible. Therefore, this is done by an **input** module (for example: UDPInput, TCPInput, UDR600) instead of a recording module (for example EDRRecorder, D6Recorder, S4Recorder).
When setting recording parameters in a recording module, it can be selected to use the TOR from the data or the current system time to time stamp the file header and folder name. (See for example Figure 6-84)

The **time of detection** (TOD), present in the EDR, D6 or S4 file, is received from the radar data content or, in case of ADS-B data extracted by the RIM782 in combination with a GPS450, the RIM782 sets the TOD.

The **UDR module** can further be used to **synchronise the PC clock with UTC time** by selecting the checkbox "**use as timekeeper**". (See for example Figure 6-194) Proprietary hardware such as RIM782, UDR600, RDR803, enables the UDR module. The UDR will check each second whether the PC clock has to be synchronized with the GPS time or not.
On the condition that the GPS450 sends a valid time message to the UDR (the time message is valid once the GPS450 receives enough satellite signals and had sufficient time to get synchronized.); and the difference with the PC clock is more than 100ms, the PC clock is corrected.

When no GPS450 or **other time source** (e.g. **NTP time server**) is available, the PC time can also be synchronized with the time present in the North Messages of ASTERIX CAT002 or 034 data, by using their respective convert modules. It is required to pass also the **ARP pulse** to the input of the convert module, using the event output of the UDR input module, in order to calculate the difference in receive time of the ARP and the TOD of the North message. A time synchronization routine will correct the PC time when the time difference is more than 100ms. (See also the tutorial at the end of the TMD3 usermanual, IE-UM-00030-xxx TMD3.pdf)

Whether a time server, GPS450 or North Message + ARP is used to synchronise PC time, the date is not corrected and will have to be set manually.

6.1 ADCCP Convert

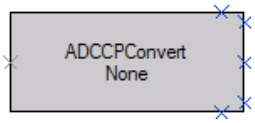


Figure 6-4: ADCCP Convert software component symbol

Purpose: Convert ADCCP digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts clean ADCCP data.

Output: Five output channels. ADCCP data in D6, text, vector or EDR format. Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the ADCCPConvert software component symbol in the session configuration diagram. Following dialogs are shown:

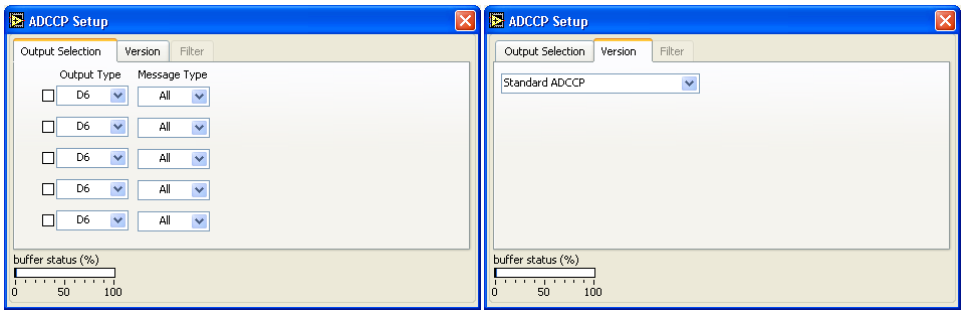


Figure 6-5: ADCCPConvert configuration interfaces

Output selection: 5 output channels can be selected. For each channel, select the appropriate output type: D6, txt, vector or EDR. Choose the appropriate message type for every enabled channel to filter on: Status/Target/Weather/Strobe/Map or All messages

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Version: Select the correct version of ADCCP: Standard or LRR

Filter: disabled, reserved for future development

Buffer status: shows the component's input FIFO buffer fill status.

6.2 ADS-B Decoder

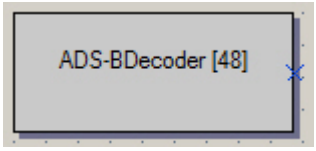


Figure 6-6: ADS-B Decoder software component symbol

Purpose: to input ADS-B data.

Inputs: None, direct interface to RIM782 and UVR892 hardware.

In combination with a RIM the ADS-B Decoder module will only appear when the USB Video output is connected to the pc running the DHM server.

Outputs: One single output that must be connected to the ADS-B-module.

Configuration: Double click the ADS-BDecoder software component symbol in the session configuration diagram. Following dialog is shown:

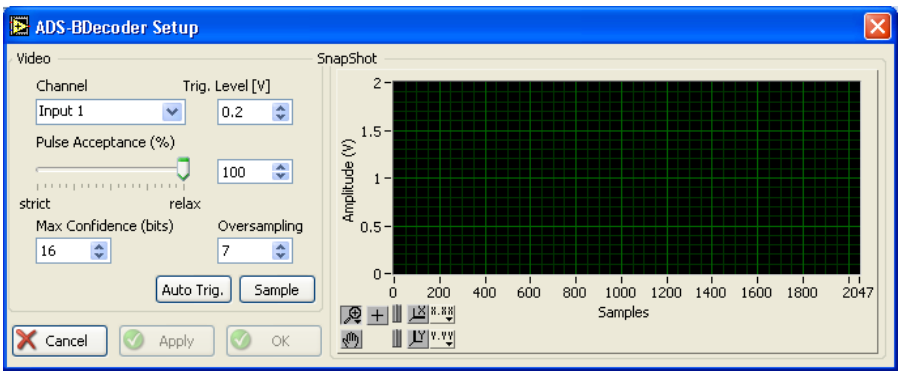


Figure 6-7: ADS-BDecoder configuration interface

Channel: 1 and 2 in combination with the UVR892. 1 to 6 corresponds to the video channels on the RIM782. Ch1 to 4 for Input 1 to 4, I for Input 5 and Q for Input 6.

Trigger Level: the trigger level must be set just above the peaks of the noise floor. Use the horizontal zoom button to zoom in on the noise floor.

Pulse Acceptance: (min.0, max. 100). These are % values resulting in a value use internally to determine if pulses are accepted as belonging to the same reply.

Max. Confidence: (bits): (min. 0, max. 16) number of bits that may be corrected during the error correction phase by use of the CRC. Using a larger number of bits will result in more processor load. Selecting 0 will remove all corrupted packets.

Oversampling: (min.1, max. 7) select the number of possible replies when a valid preamble is detected.

Auto Trigger: automatically calculates a trigger level, based on the peaks measured in the snapshot.

Snapshot window: every time the Sample-button is pressed, the snapshot-window is updated.

Status: Right click the ADS-BDecoder software component symbol in the session configuration diagram and select status. Following dialog is shown:

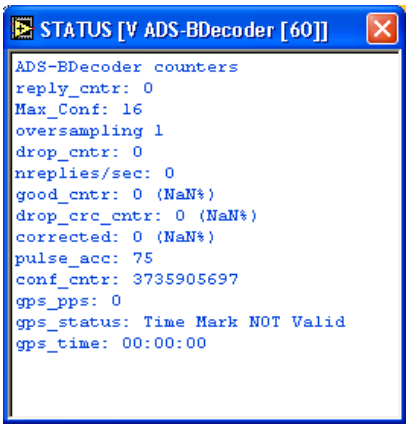


Figure 6-8: ADS-BonRIM status

Reply counter: incremental counter showing the number of replies

Max_Conf: as set by the max confidence parameter

Oversampling: as set by the oversampling parameter

Drop counter: number of replies dropped by the RIM, if this increments at a fast pace adjust trigger level.

Nreplies/sec: number of replies per second, average number of replies during the last 10 seconds.

Good_cntr: number of replies that didn't need error correction

Drop_crc_cntr: rejected replies due to CRC error

Corrected: replies with corrected CRC error

Pluse_acc: internal value determined by the 1-100% pulse acceptance parameter

Conf_cntr: snapshot of the current reply's confidence bits

Gps_pps: pulse per second from GPS signal

Gps_status: status of the GPS, locked means valid timestamping

Gps_time: GPS time

The status windows can be used to get the configuration parameters set for best performance. The configurable parameters, together with site setup and conditions, have an influence on Coverage, Probability of detection, Plot Quality, RIM782 Processing Load, ... The optimal parameters setting will depend on what is desired to be detected. Figure 6-7 shows a configuration as described in heading 2.2 of [IE-UM-00054-002 ADS-B 1090ES Extractor] tuned for maximum number of tracked detections (see Figure 6-12) during peak traffic over Belgium.

6.3 ADS-B on RIM

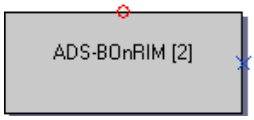


Figure 6-9: ADS-BOnRIM

The ADS-B on RIM module has been replaced by the ADS-B Decoder module and is no longer available for new sessions. For compatibility reasons, earlier sessions might still load with this module. We recommend replacing the ADS-B on RIM module in these sessions.

6.4 ADS-B

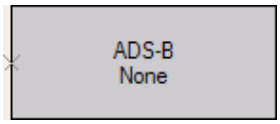


Figure 6-10: ADS-B

Purpose: Converts ADS-B digital messages to other formats as described by the output and configuration sections below.

Inputs: ADS-B input from the ADS-BDecoder module

Output: Multiple outputs. The output format can be configured in the ADS-B configuration screen. Currently EDR, IRD and D6 are supported.

Configuration: Double click the ADS-B software component symbol in the session configuration diagram. Following dialog is shown:

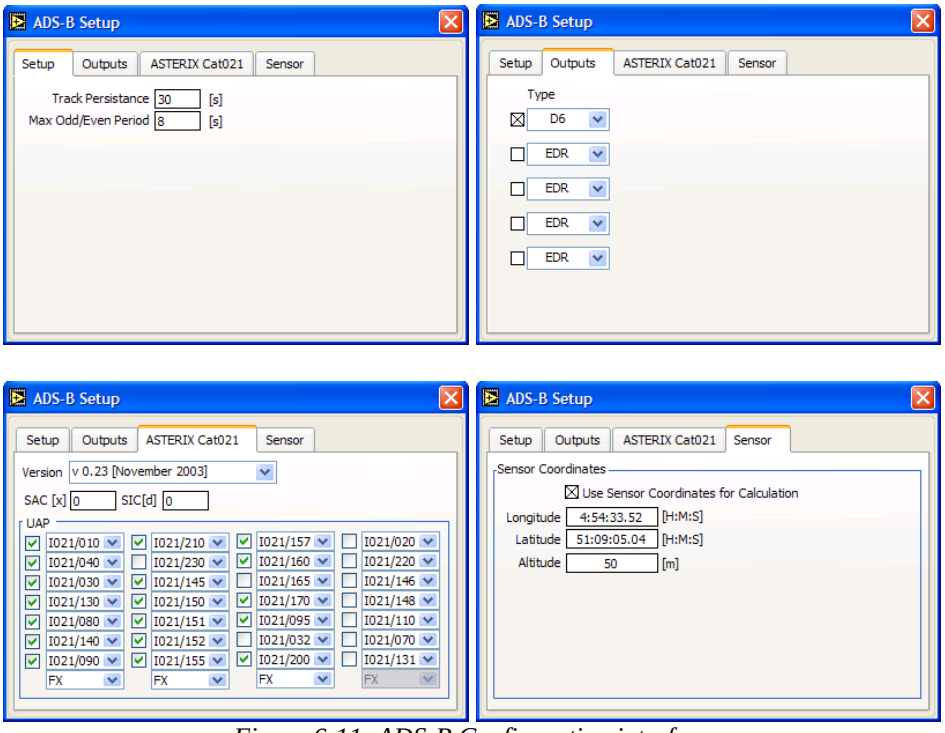


Figure 6-11: ADS-B Configuration interface

Setup: Track persistence: Period that the ADS-B track is maintained without update.
Max Odd/Even period: Max period between odd and even message for ADS-B track to start.

Outputs: three formats are supported: EDR (use this to output to an AsterixCat21Convert or to make an EDR-recording), IRD (RASS-S compatible format) and D6 (display, analysis).

AsterixCat021: Here you can completely define the UAP for the ASTERIX cat021 content according to the EUROCONTROL standards for the ADS-B messages. Version 0.23 and 0.26 is implemented.

Sensor: You can fill in the longitude, latitude and altitude of the sensor where the ADS-B data originates from. Use the tick box to use

these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).

Status: Right click the ADS-B software component symbol in the session configuration diagram. Following dialog is shown:

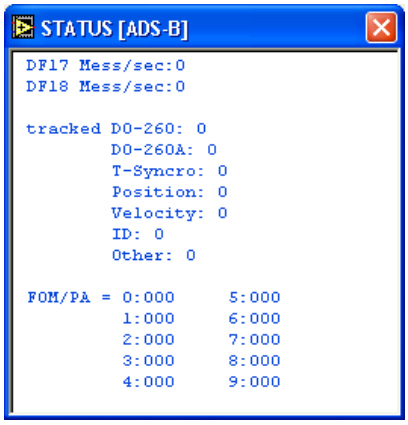


Figure 6-12: ADS-B Status window

ADS-B messages/sec: Number of valid ADS-B messages received per second

DO-260: Number of DO-260 type transponders currently tracked

DO-260A: Number of DO-260A type transponders currently tracked

T-Syncro: Time-synchronization value (in case of FOM 8-9)

Position: Number of transponders transmitting position information that are currently tracked

Velocity: Number of transponders transmitting velocity information that are currently tracked

ID: Number of transponders transmitting ID information that are currently tracked

Other: Number of transponders transmitting other than the above mentioned information that are currently tracked

FOM/PA Number of ADS-B targets according to their Figure of Merit.

6.5 AircatConvert

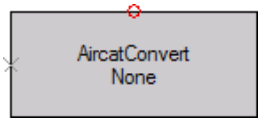


Figure 6-13: AircatConvert

Purpose: Convert Aircat digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts clean Aircat data.

Output: Five output channels. Aircat data in D6, text, EDR or Replay format. Outputs are numbered clockwise starting with the top leftmost blue X.
Event output generates event data (North, Sector crossing, Sector 0).

Configuration: Double click the AircatConvert software component symbol in the session configuration diagram. Following dialog is shown:

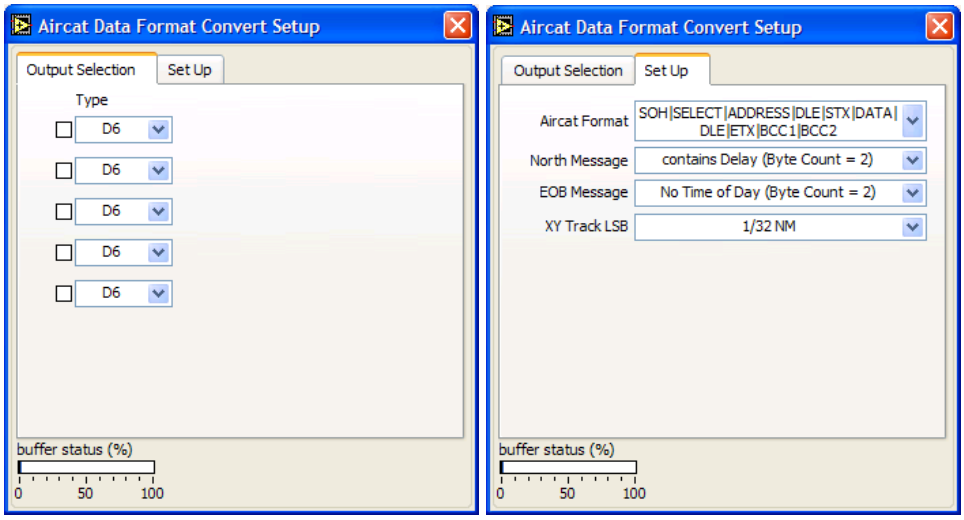


Figure 6-14: AIRCATConvert configuration interface

Output selection: 5 output channels can be selected. For each channel, select the appropriate output type: D6, txt or EDR.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Set Up:
Aircat Format: Select the correct format
North Message: select the north message content
EOB Message: select the EOB message
XY Track LSB: select the XY track LSB

Buffer status: shows the component's input FIFO buffer fill status.

6.6 AleniaRHPConvert

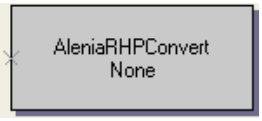


Figure 6-15: AleniaRHP Convert software component symbol

Purpose: Convert Alenia RHP digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean Alenia RHP data without the presence of transport protocol framing data.

Alenia RHP uses U-HDLC with one header byte. The U-HDLC module by default strips 2 bytes (header and format,) so reconfigure it to only strip the header byte (see 6.77).

Outputs: Up to 5 outputs, each output has an associated output format, which can be configured using the AleniaRHPConvert configuration screen.
Supported output formats are: D6, text, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AleniaRHPConvert software component symbol in the session configuration diagram. Following dialog is shown:

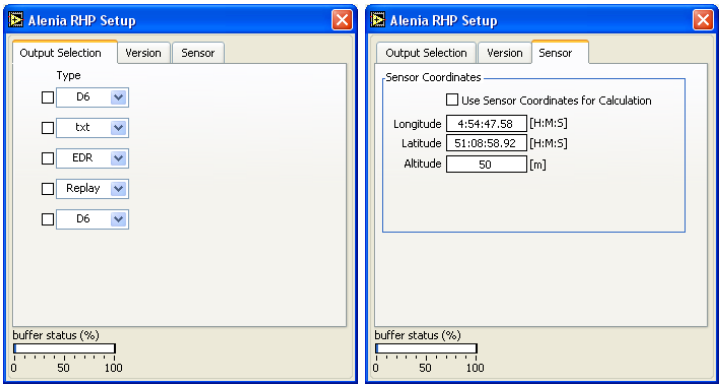


Figure 6-16: AleniaRHPConvert Configuration interface

Output selection: 5 output channels can be selected. For each channel, select the appropriate output type: D6, txt, EDR or Replay.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Sensor: You can fill in the longitude, latitude and altitude of the sensor where the RADAR data originates. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).

Version: Version 04 [13/01/91] is implemented.

Buffer status: shows the component's input FIFO buffer fill status.

6.7 ARUP Convert

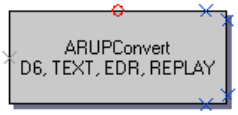


Figure 6-17: ARUP Convert software component symbol

Purpose: Convert ARUP digital plot and sector message format to other formats as described by the output and configuration sections below. Jamming and Clutter map data will be discarded.

Inputs: Single input accepts data in raw EDR V2 format. The data presented at the input must be clean ARUP data without the presence of transport protocol framing.

Outputs: Up to 5 outputs, each output has an associated output format, which can be configured in the Output Selection tab of the configuration screen.
Supported output formats are: D6, text, EDR and replay.
Outputs are numbered clockwise starting with the top right blue X.

Configuration: Double click the ARUP Convert software component symbol in the session configuration diagram. Following dialog is shown:

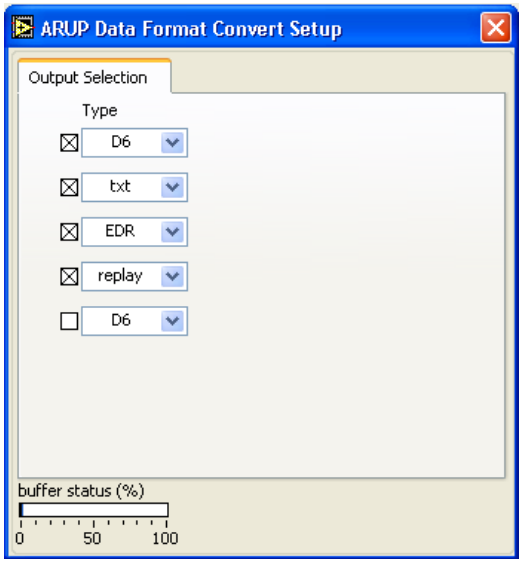


Figure 6-18: ARUP Convert Configuration interface

Output selection: 5 output channels can be selected. For each channel, select the appropriate output type: D6, txt, EDR or Replay.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Buffer status: shows the component's input FIFO buffer fill status.

6.8 ASR9Convert

Figure 6-19: ASR9Convert software component symbol

Purpose: Convert digital messages ASR-9 (Airport Surveillance Radar 9) 13-bit CD format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASR9 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the ASR9Convert configuration screen.
Supported output formats are: D6 and text.

Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the ASR9Convert component symbol in the session configuration diagram. Following dialog is shown:

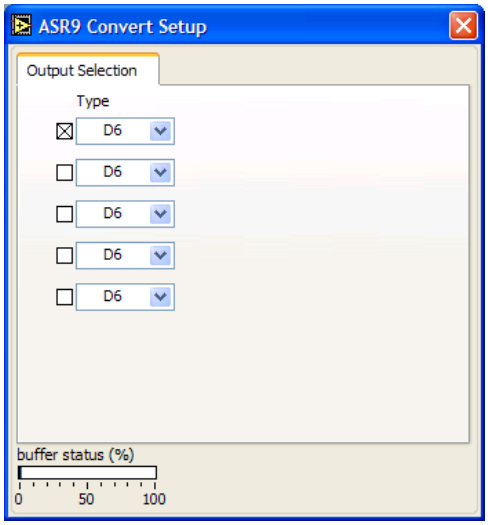


Figure 6-20: ASR9Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.9 AsterixCat001_002Convert

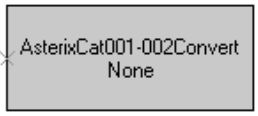


Figure 6-21: AsterixCat001-002Convert software component symbol

Purpose: Convert ASTERIX Cat001 (Monoradar data target reports) and Asterix Cat002 (Monoradar service messages) digital messages format to other formats as described by the output and configuration sections below. This component replaces the components described in heading 6.10 and 6.11 and have been added to be compatible with future RASS-M. Main difference is that output remains synchronous with the sequence of the input packets, which is not the case with an ASTERIX splitter and the separate ASTERIX Cat001 and ASTERIX Cat002 converters. Use the separate converters only in case status output is required.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX Cat001 and/or ASTERIX Cat002 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat001-002Convert configuration screen. Supported output formats are: D6, text, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat001-002Convert software component symbol in the session configuration diagram. Following dialog is shown:

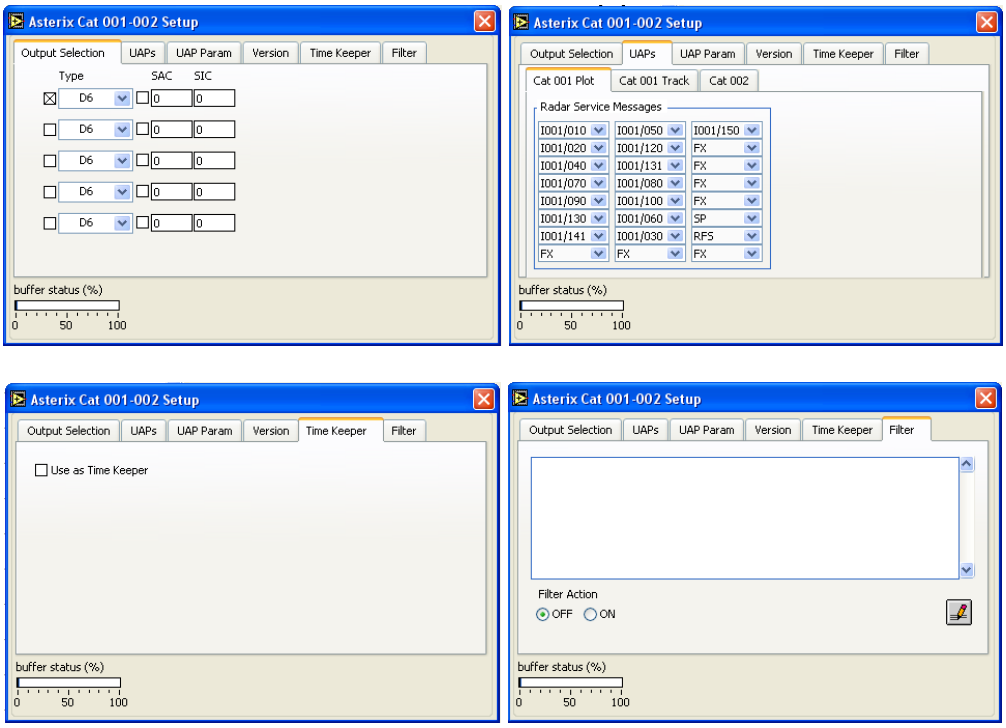


Figure 6-22: AsterixCat001-002Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAPs” tab on top of the configuration window to edit the assignment of Data Items to the corresponding CAT001 or CAT002 Data Fields.

Click on the “UAP Param” tab to fill in the CAT001 scaling.

Click on the “Version” tab to select the correct version of each ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.

Click on the “Time Keeper” tab and tick the checkbox if you want to use the ASTERIX CAT002 data stream as time keeper for the computer. Based on the North messages received in the data and the ARP pulses input by hardware (e.g. the RIM782), an exact time is calculated. This time is used to synchronize the pc time.

Filter: use the filter to filter on every data item according to the ASTERIX UAP. Choose the appropriate Filter Action: OFF or On.
By clicking the filter field or the pencil button, the editor window will open:

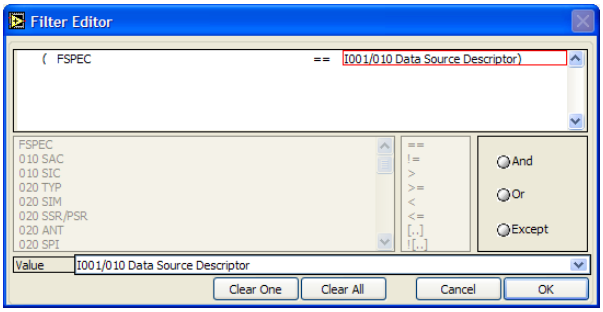


Figure 6-23: AsterixCat001 Filter Editor

The filter editor is self-explanatory: select a type to filter on, a proper condition and a logical relation between types. [..] Means “contains” while ![..] means “does not contain”. When filtering on FSPEC, all the FSPEC items will appear in a dropdown list (Value field). Finally, after pressing OK, you will see the result appearing in the filter pane.

This filter engine is the same as used in the MRD3 as S-filter. Therefore you need to install the DHM on a computer when you want to make use of the S-filter in the MRD3!

6.10 AsterixCat001Convert

Figure 6-24: AsterixCat001Convert software component symbol

Purpose: Convert ASTERIX CAT001 (Monoradar data target reports) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2.0 format. This means that the data presented must be clean ASTERIX CAT001 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat001Convert configuration screen.
Supported output formats are: D6, txt, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat001Convert software component symbol in the session configuration diagram. Following dialog is shown:

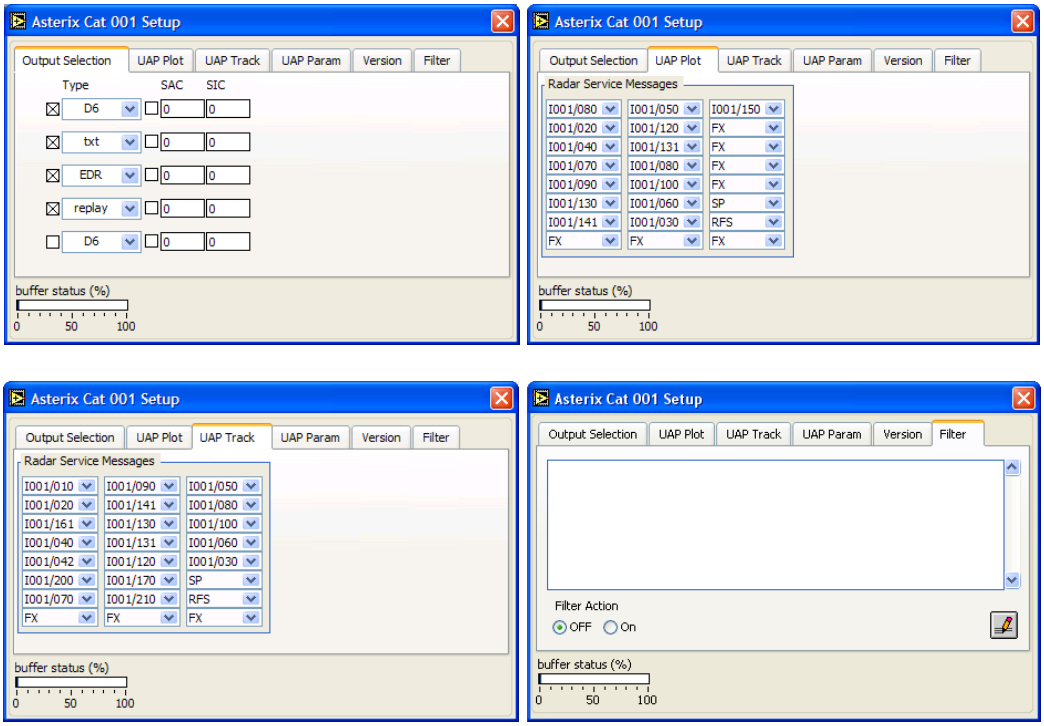


Figure 6-25: AsterixCat001Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAP Plot” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the “UAP Track” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Track Data.

Click on the “UAP Param” tab to fill in the scaling.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.

Filter: use the filter to filter on every data item according to the ASTERIX UAP. Choose the appropriate Filter Action: OFF or On.
When clicking the filter field or the pencil button, the following window will open:

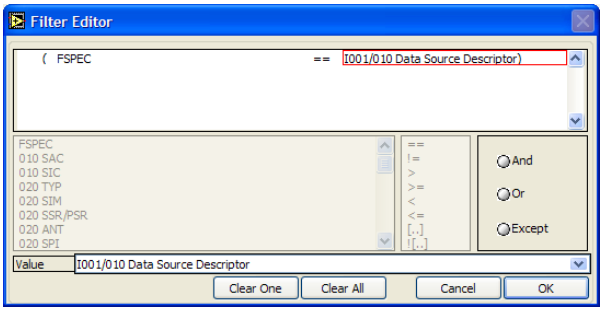


Figure 6-26: AsterixCat001 Filter Editor

The filter editor is self-explanatory: select a type to filter on, a proper condition and a logical relation between types. [..] Means “contains” while ![..] means “does not contain”. When filtering on FSPEC, all the FSPEC items will appear in a dropdown list (Value field). Finally, after pressing OK, you will see the result appearing in the filter pane.

This filter engine is the same as used in the MRD3 as S-filter. Therefore you need to install the DHM on a computer when you want to make use of the S-filter in the MRD3!

You can better use the AsterixCat001_002Convert module that preserves the correct message sequencing.

6.11 AsterixCat002Convert

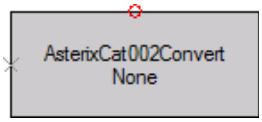


Figure 6-27: AsterixCat002Convert software component symbol

Purpose: Convert ASTERIX CAT002 (Monoradar service messages) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT002 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat002Convert configuration screen.
Supported output formats are: D6, text, EDR, status and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.
Event output generates event data (North, Sector crossing, Sector 0).

Configuration: Double click the AsterixCat002Convert software component symbol in the session configuration diagram. Following dialog is shown:

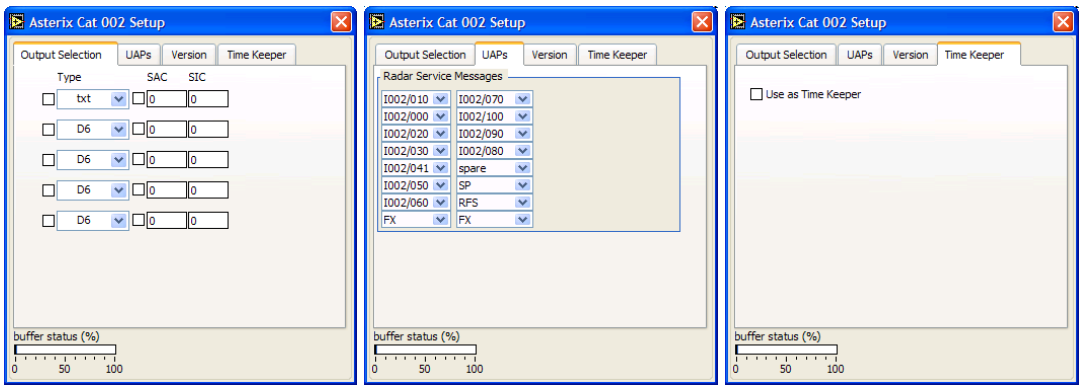


Figure 6-28: AsterixCat002Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAPs” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.

Click on the “Time Keeper” tab and select the tickbox if you want to use the ASTERIX CAT002 datastream as time keeper for the computer. Based on the North messages received in the data and the ARP pulses input by hardware (e.g. the RIM782), an exact time is calculated. This time is used to synchronize the pc time.

You can better use the AsterixCat001_002Convert module that preserves the correct message sequencing.

6.12 AsterixCat008Convert

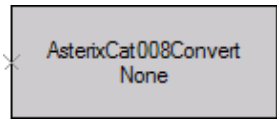


Figure 6-29: AsterixCat008Convert software component symbol

Purpose: Convert ASTERIX CAT008 (Monoradar derived weather information) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2.0 format. This means that the data presented must be clean ASTERIX CAT008 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat008Convert configuration screen.
Supported output formats are: text, EDR, replay and vector.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat008Convert software component symbol in the session configuration diagram. Following dialog is shown:

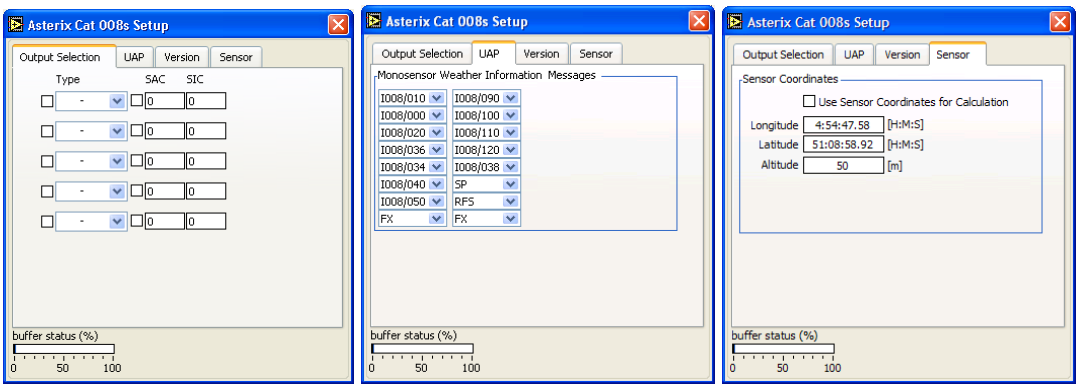


Figure 6-30: AsterixCat008Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAP” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.

Click on the “Sensor” tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT008 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).

6.13 AsterixCat010Convert

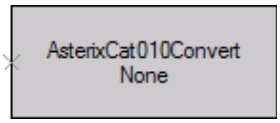


Figure 6-31: AsterixCat010Convert software component symbol

Purpose: Convert ASTERIX CAT010 (Monosensor Surface Movement Data) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT010 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat010Convert configuration screen.
Supported output formats are: D6, text, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat010Convert software component symbol in the session configuration diagram. Following dialog is shown:

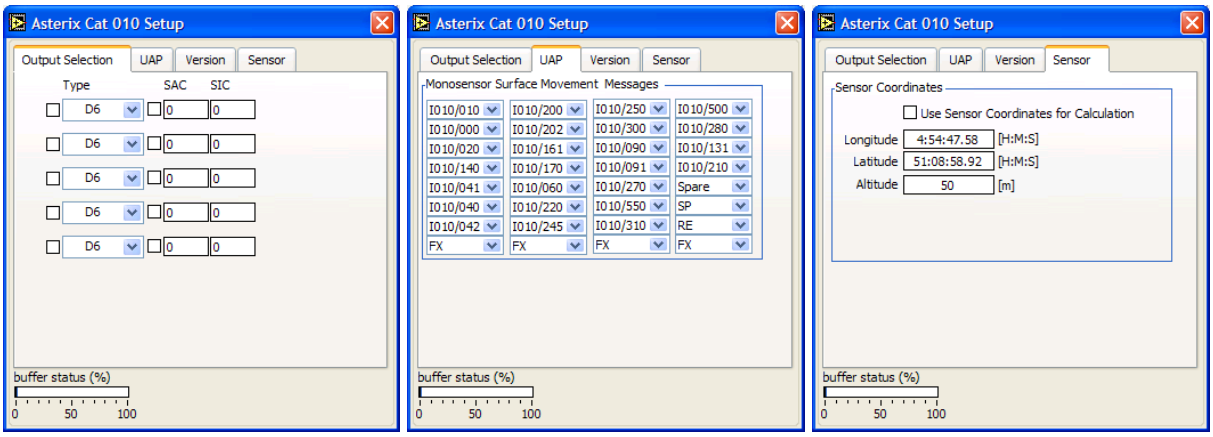


Figure 6-32: AsterixCat010Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAP” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.

Click on the “Sensor” tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT010 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).

6.14 AsterixCat011Convert

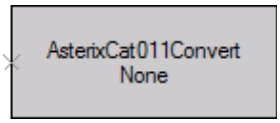


Figure 6-33: AsterixCat011Convert software component symbol

Purpose: Convert ASTERIX CAT011 (Advanced-SMGCS Data) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT011 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat011Convert configuration screen.
Supported output formats are: D6, text, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat011Convert software component symbol in the session configuration diagram. Following dialog is shown:

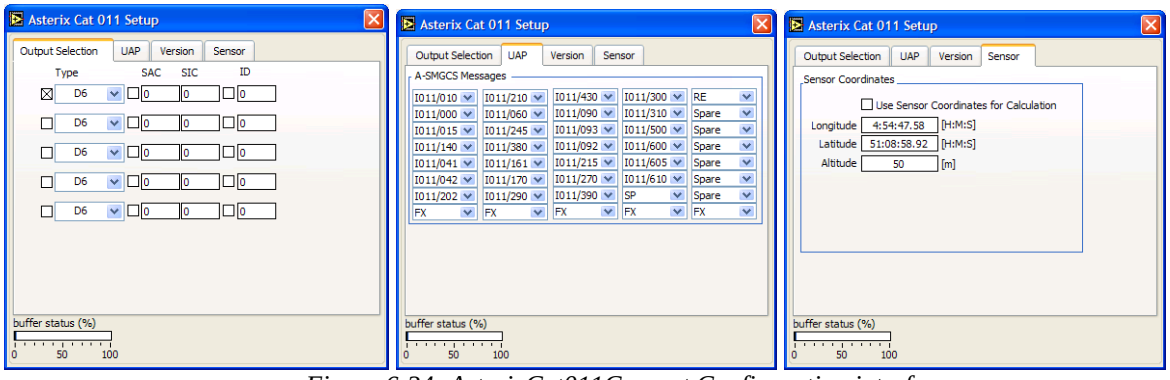


Figure 6-34: AsterixCat011Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output. In a similar way, filtering on the “ID” can be done.

Click on the “UAP” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.0 is implemented.

Click on the “Sensor” tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT011 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.15 AsterixCat017Convert

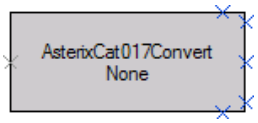


Figure 6-35: AsterixCat017Convert software component symbol

Purpose: Convert ASTERIX CAT017 (Mode-S Surveillance Co-ordination Function messages) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT017 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat017Convert configuration screen.
Supported output formats are: D6, text, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat017Convert software component symbol in the session configuration diagram. Following dialogs are shown:

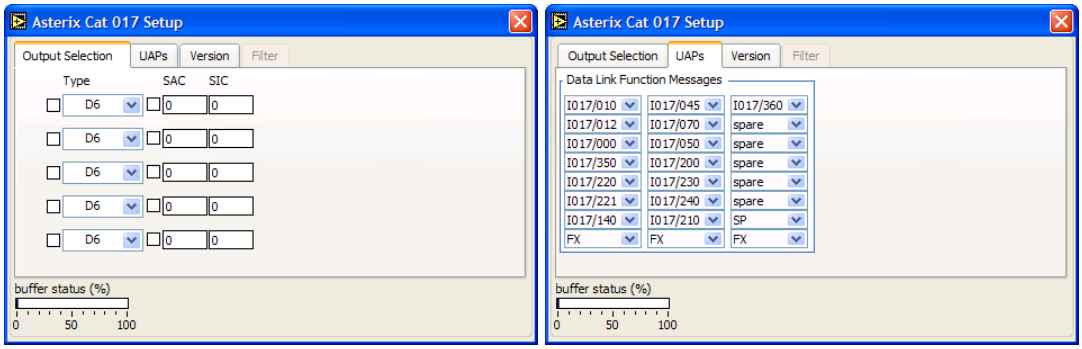


Figure 6-36: AsterixCat017Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.2 is implemented.

6.16 AsterixCat018Convert

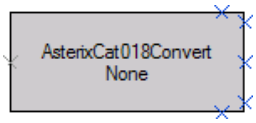


Figure 6-37: AsterixCat018Convert software component symbol

Purpose: Convert ASTERIX CAT018 (Mode-S Data-Link Function messages) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT018 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat018Convert configuration screen.
Supported output formats are: D6, text, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat018Convert software component symbol in the session configuration diagram. Following dialogs are shown:

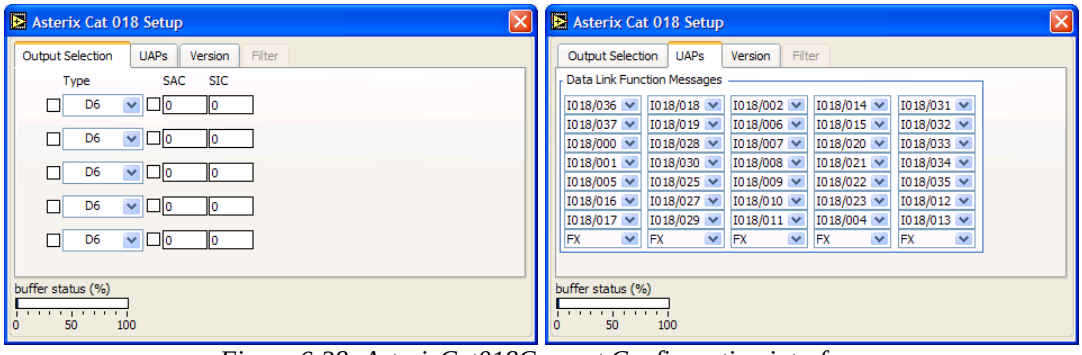


Figure 6-38: AsterixCat018Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the "SAC" and "SIC" fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the "SAC" and "SIC" Fields is converted for this output.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

Click on the "UAP" tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the "Version" tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.6 is implemented.

6.17 AsterixCat019Convert

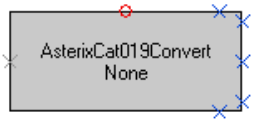


Figure 6-39: AsterixCat019Convert software component symbol

Purpose: Convert ASTERIX CAT019 (MLT System Status Messages) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT019 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat019Convert configuration screen.
Supported output formats are: text, EDR, status and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.
Event output generates event data (North, Sector crossing, Sector 0).

Configuration: Double click the AsterixCat019Convert software component symbol in the session configuration diagram. Following dialogs are shown:

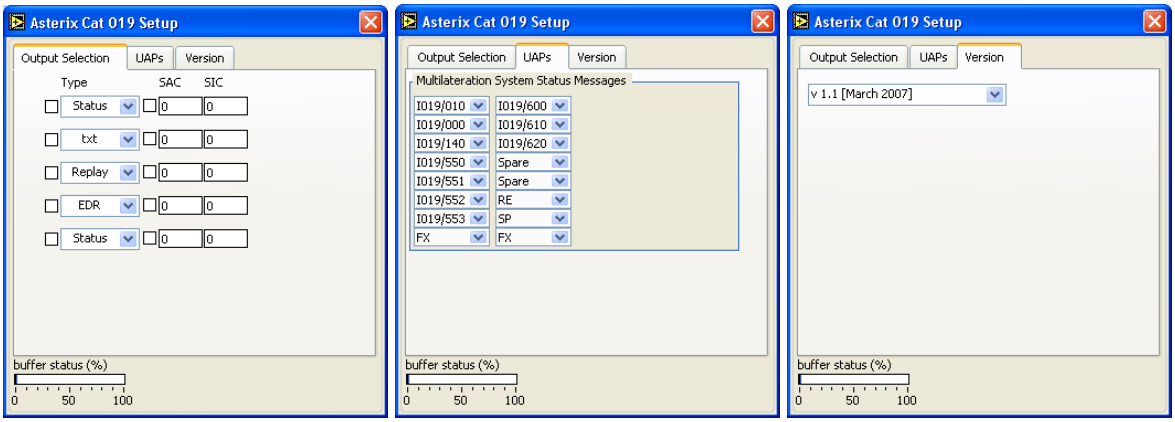


Figure 6-40: AsterixCat019Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAP” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.1 is implemented.

6.18 AsterixCat020Convert

Figure 6-41: AsterixCat020Convert software component symbol

Purpose: Convert ASTERIX CAT020 (MLT Messages) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT020 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat020Convert configuration screen.
Supported output formats are: D6, text, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat020Convert software component symbol in the session configuration diagram. Following dialog is shown:

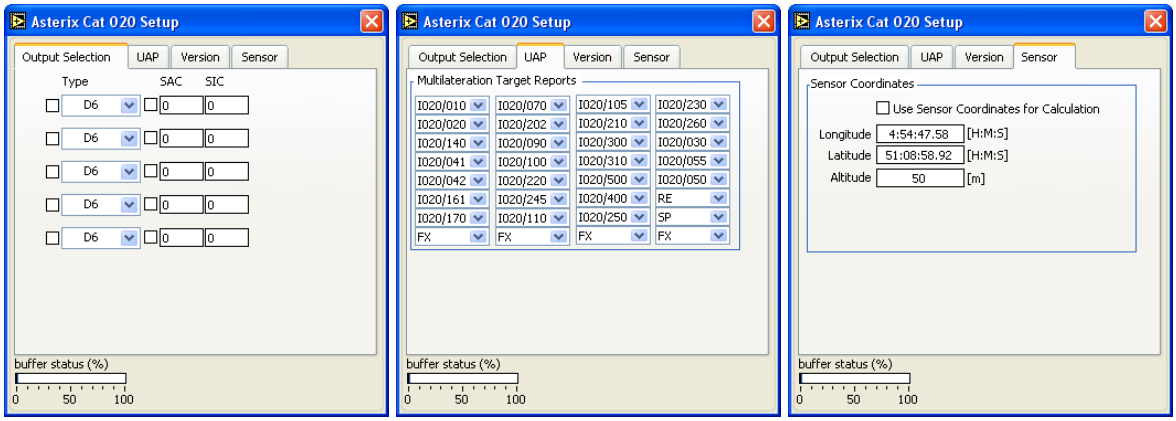


Figure 6-42: AsterixCat020Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAP” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.5 is implemented.

Click on the “Sensor” tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT020 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).

6.19 AsterixCat021Convert

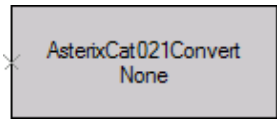


Figure 6-43: AsterixCat021Convert software component symbol

Purpose: Convert ASTERIX CAT021 (ADS-B Messages) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT021data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat021Convert configuration screen.
Supported output formats are: D6, text, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat021Convert software component symbol in the session configuration diagram. Following dialogs are shown:

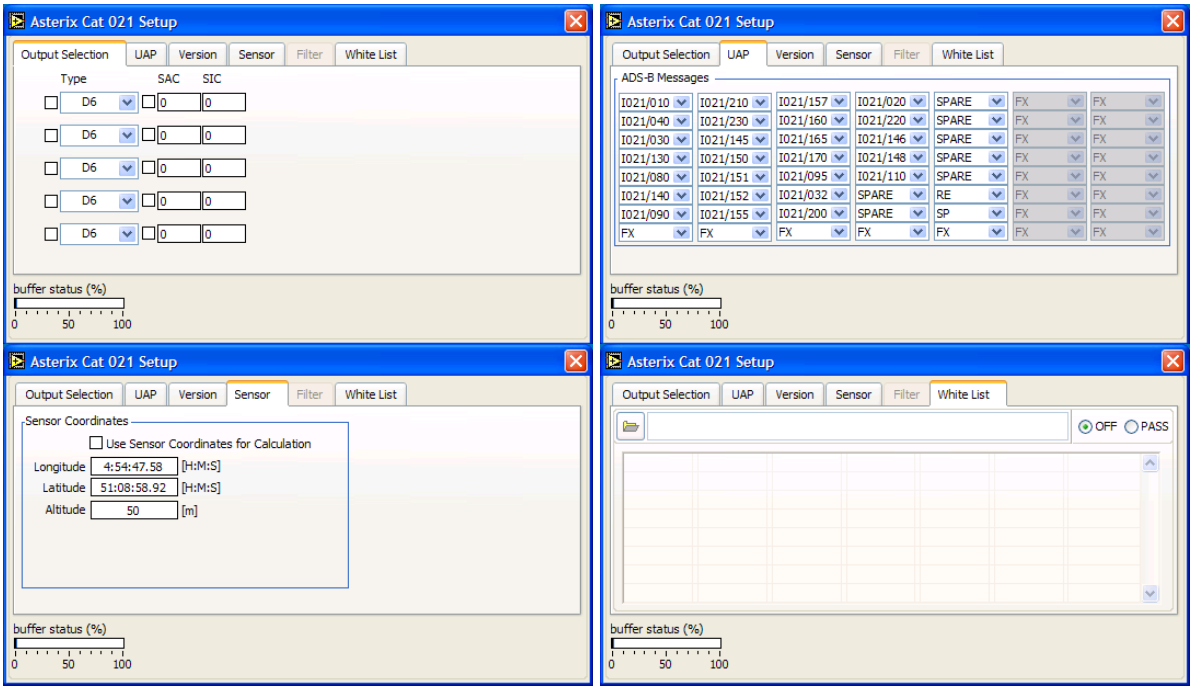


Figure 6-44: AsterixCat021Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data

on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAP” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 0.23, 0.26 and 1.0 is implemented.

Click on the “Sensor” tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT021 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).

Click on the “White List” tab to load a .TXT-file with one MODE-S addresses per line. When the “PASS” radio button is checked, only the MODE-S addresses in the white list will pass the AsterixCat021Convert.

6.20 AsterixCat030Convert

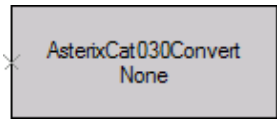


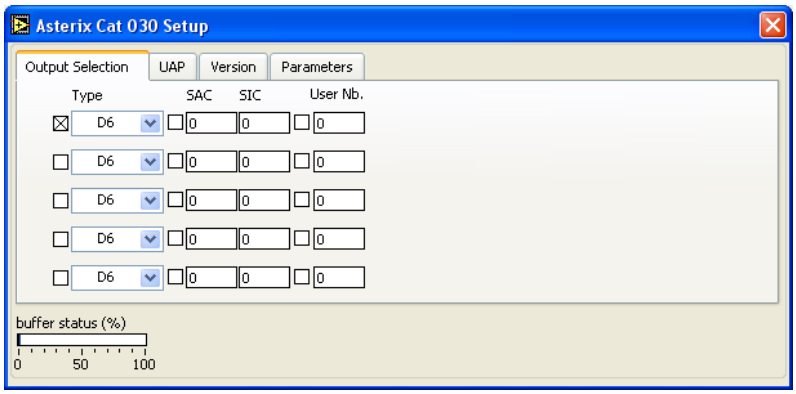
Figure 6-45: AsterixCat030Convert software component symbol

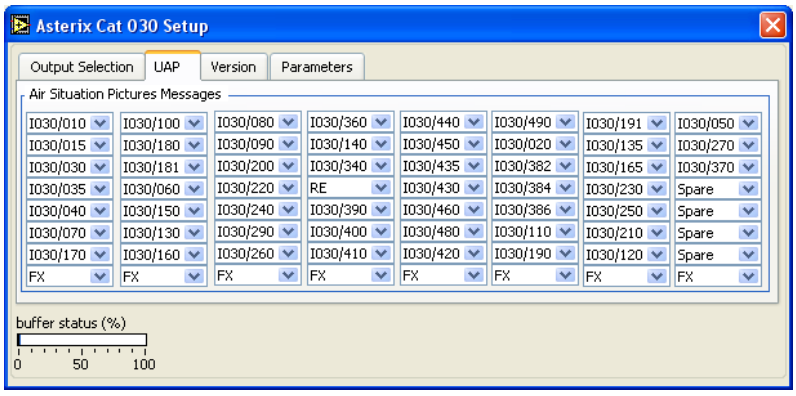
Purpose: Convert ASTERIX CAT030 (Exchange of Air Situation Pictures) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT030 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat030Convert configuration screen.
Supported output formats are: D6, text, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat030Convert software component symbol in the session configuration diagram. Following dialog is shown:





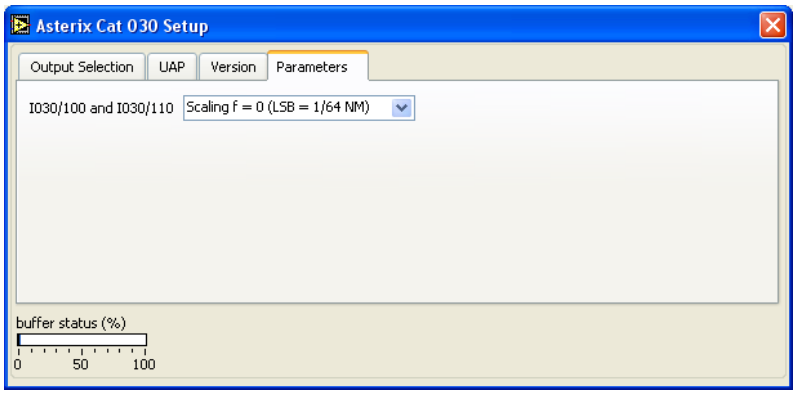


Figure 6-46: AsterixCat030Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output. In a similar way, filtering on the “User number” can be done.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAP” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 2.5ter and 6.2 is implemented.

Click on the “Parameters” tab to select the scaling factor for calculated track position - range.

6.21 AsterixCat031Convert

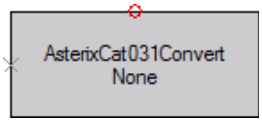


Figure 6-47: AsterixCat031Convert software component symbol

Purpose: Convert ASTERIX CAT031 (Sensors Information messages) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT031data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat031Convert configuration screen.
Supported output formats are: text, status, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.
Event output generates event data (North, Sector crossing, Sector 0).

Configuration: Double click the AsterixCat031Convert software component symbol in the session configuration diagram. Following dialog is shown:

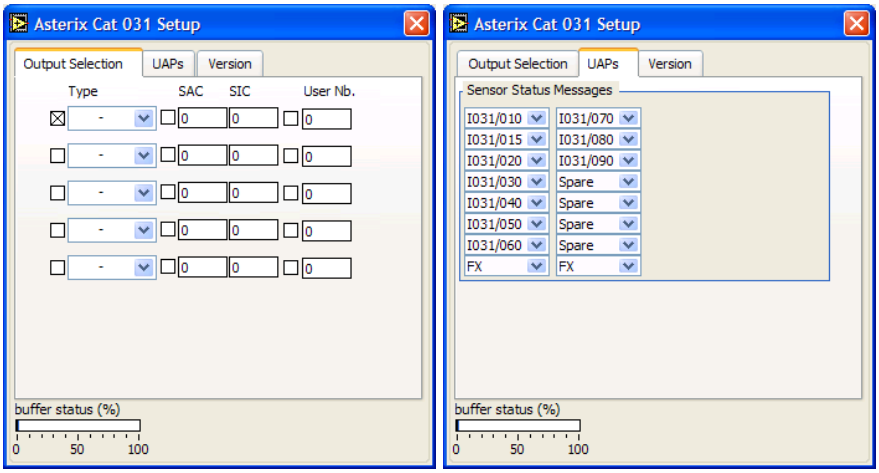


Figure 6-48: AsterixCat031Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output. In a similar way, filtering on the “User number” can be done.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAP” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields for the Plot Data.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 6.2 is implemented.

6.22 AsterixCat034_048Convert

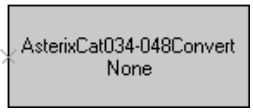


Figure 6-49: AsterixCat034-048Convert software component symbol

Purpose: Convert ASTERIX CAT034 (Monoradar service messages) and CAT048 (Monoradar data target reports) digital messages format to other formats as described by the output and configuration sections below. This component replaces the components described in heading 6.23 and 6.24 and have been added to be compatible with future RASS-M. Main difference is that output remains synchronous with the sequence of the inputted packets, which is not the case with an ASTERIX splitter and the separate ASTERIX CAT034 and ASTERIX CAT048 converters. Use the separate converters only in case status output is required.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT034 and/or ASTERIX CAT048 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat034-048Convert configuration screen. Supported output formats are: D6, text, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat034-048Convert software component symbol in the session configuration diagram. Following dialog is shown:

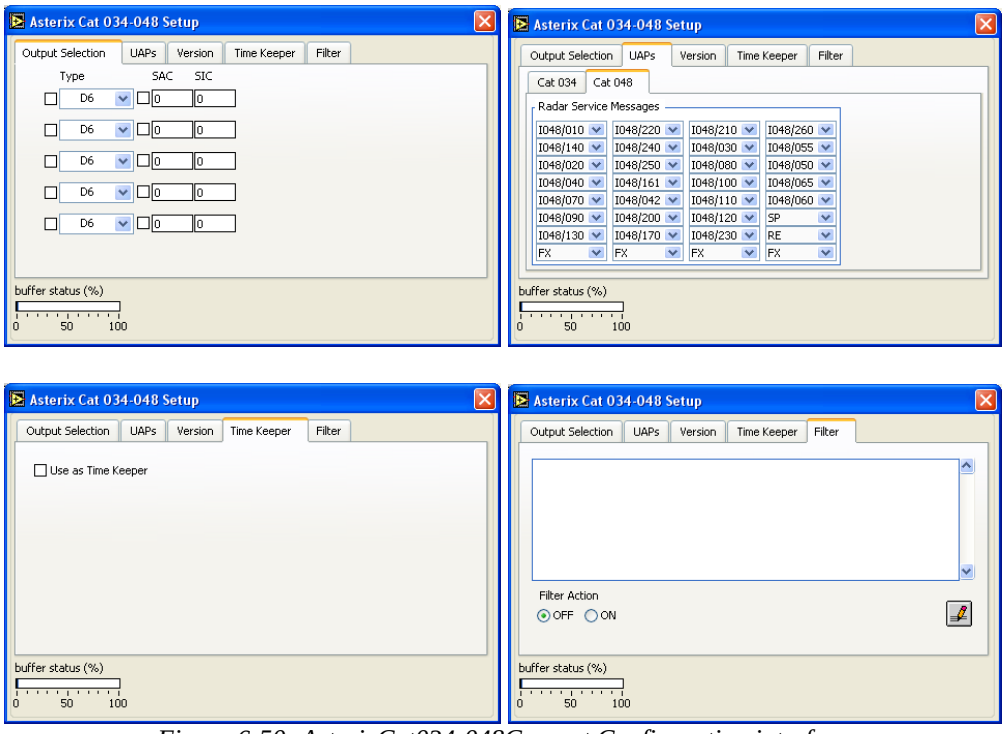


Figure 6-50: AsterixCat034-048Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAPs” tab on top of the configuration window to edit the assignment of Data Items to the corresponding CAT034 or CAT048Data Fields.

Click on the “Version” tab to select the correct version of each ASTERIX category according to the Eurocontrol specifications. For CAT034 version 1.26 and for CAT048 version 1.14 are implemented. Extended CAT48 version 1.14 is implemented. The Special Purpose (SP) field is radar manufacturer dependent, select N/A unless you have the following interface implemented:

Type 1 : Telephonics Military M5

Click on the “Time Keeper” tab and tick the checkbox if you want to use the ASTERIX CAT034 data stream as time keeper for the computer. Based on the North messages received in the data and the ARP pulses input by hardware (e.g. the RIM782), an exact time is calculated. This time is used to synchronize the pc time.

The filter mechanism is the same as for the AsterixCat001-002Convert (Paragraph 6.9). An example: Aircraft ID contains “DAT”.

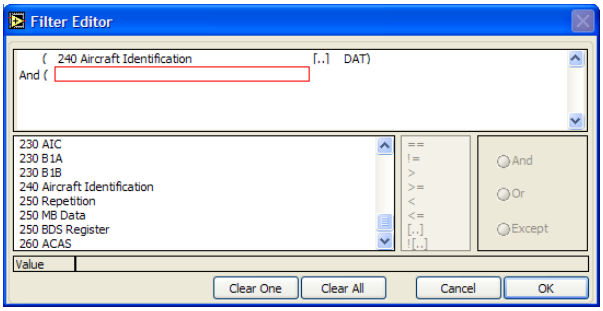


Figure 6-51: AsterixCat048 Filter Editor

6.23 AsterixCat034Convert

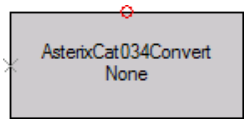


Figure 6-52: AsterixCat034Convert software component symbol

Purpose: Convert ASTERIX CAT034 (Monoradar service messages) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT034 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat034Convert configuration screen.
Supported output formats are: D6, text, EDR, status and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.
Event output generates event data (North, Sector crossing, Sector 0).

Configuration: Double click the AsterixCat034Convert software component symbol in the session configuration diagram. Following dialog is shown:

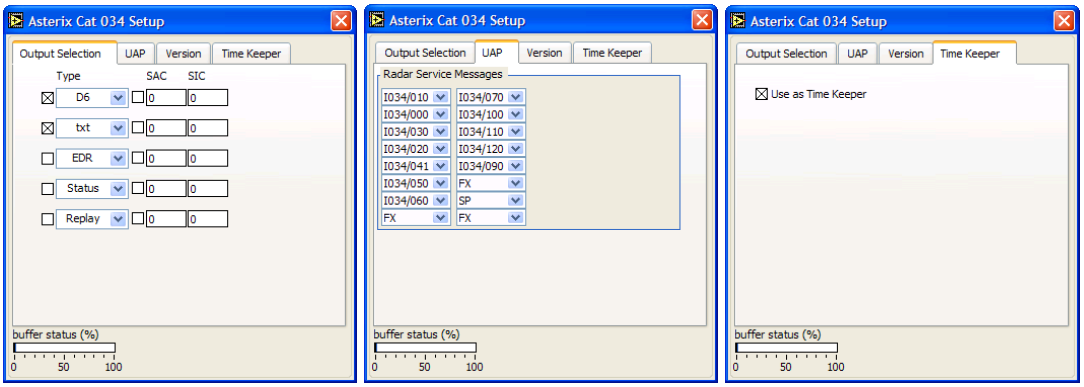


Figure 6-53: AsterixCat034Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAPs” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.26 is implemented.

Click on the “Time Keeper” tab and select the tickbox if you want to use the ASTERIX CAT034 datastream as time keeper for the computer. Based on the North messages received in the data and the ARP pulses input by hardware (e.g. the RIM782), an exact time is calculated. This time is used to synchronize the pc time.

You can better use the AsterixCat034_048Convert module that preserves the correct message sequencing.

6.24 AsterixCat048Convert

Figure 6-54: AsterixCat048Convert software component symbol

Purpose: Convert ASTERIX CAT048 (Monoradar data targets report) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT048 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat048Convert configuration screen.
Supported output formats are: D6, text, replay and EDR.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat048Convert software component symbol in the session configuration diagram. Following dialog is shown:

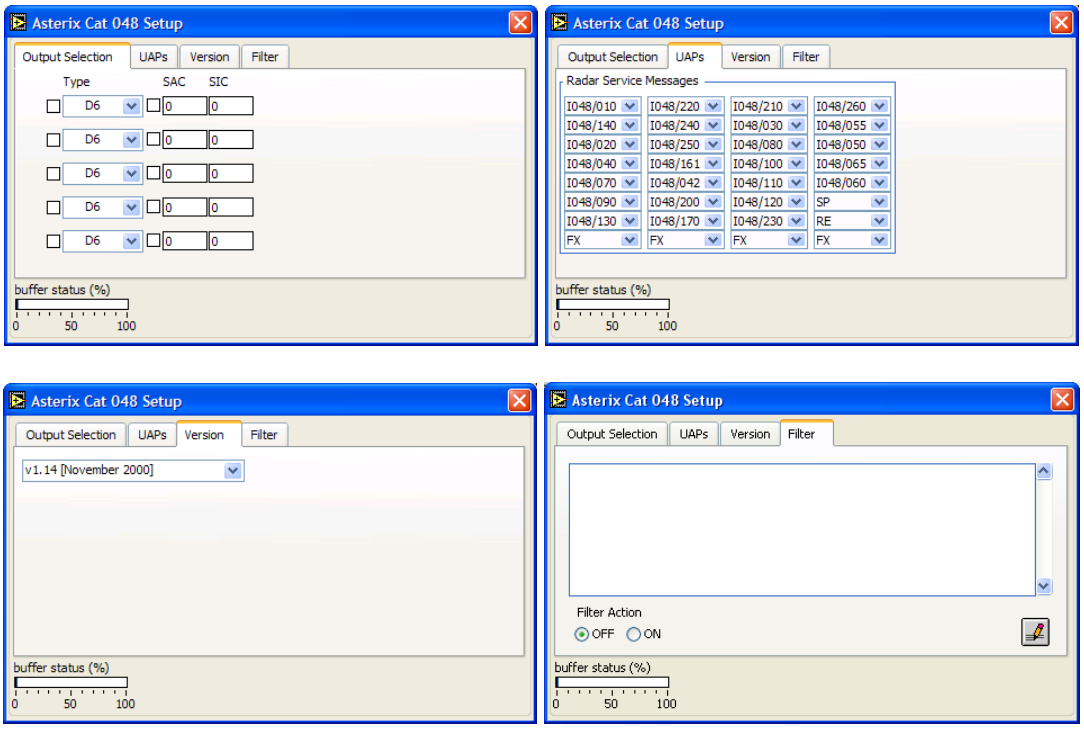


Figure 6-55: AsterixCat048Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output.

Click on the “UAPs” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.14 is implemented.

The filter mechanism is the same as for the AsterixCat001Convert. Refer to this paragraph. An example: Aircraft ID contains “DAT”.

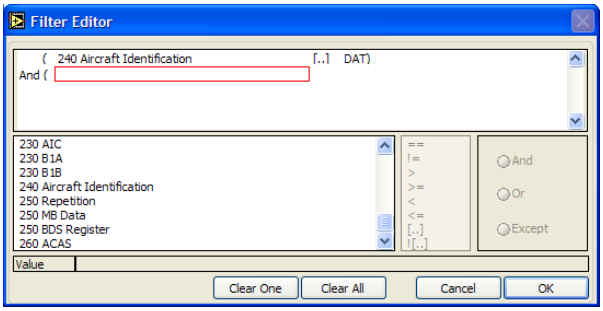


Figure 6-56: AsterixCat048 Filter Editor

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

You can better use the AsterixCat034_048Convert module that preserves the correct message sequencing.

6.25 AsterixCat062Convert

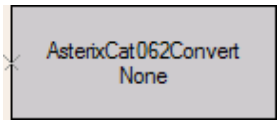


Figure 6-57: AsterixCat062Convert software component symbol

Purpose: Convert ASTERIX CAT062 (System Track Data) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT062 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat062Convert configuration screen.
Supported output formats are: D6, text, EDR and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCat062Convert software component symbol in the session configuration diagram. Following dialog is shown:

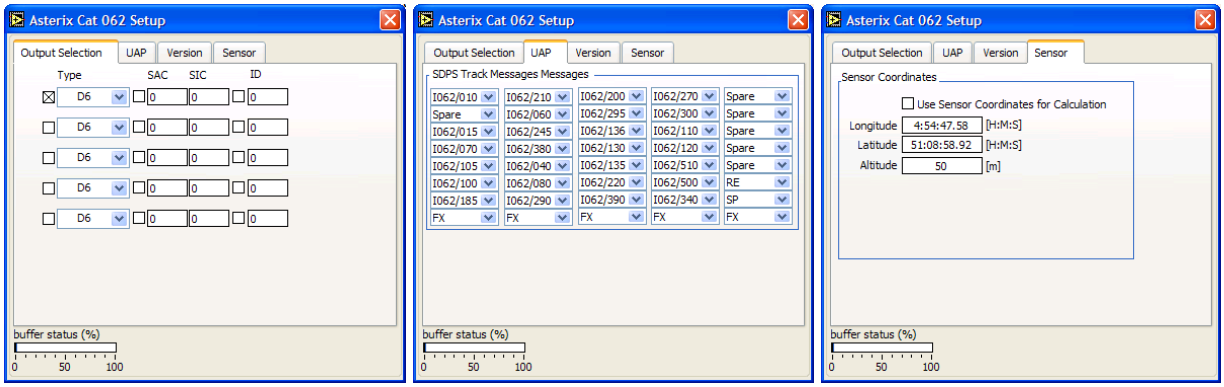


Figure 6-58: AsterixCat062Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output. In a similar way, filtering on the “ID” can be done.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAPs” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.3 and 1.11 are implemented.

Click on the “Sensor” tab to fill in the longitude, latitude and altitude of the sensor where the ASTERIX CAT062 data originates from. Use the tick box to use these settings for calculation (to convert Lon/Lat into Range/Azimuth for D6 format).

6.26 AsterixCat063Convert

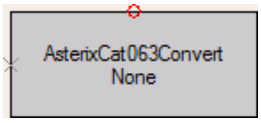


Figure 6-59: AsterixCat063Convert software component symbol

Purpose: Convert ASTERIX CAT063 (Sensor Status Messages) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT063 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat063Convert configuration screen.
Supported output formats are: text, EDR, status and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.
Event output generates event data (North, Sector crossing, Sector 0).

Configuration: Double click the AsterixCat063Convert software component symbol in the session configuration diagram. Following dialog is shown:

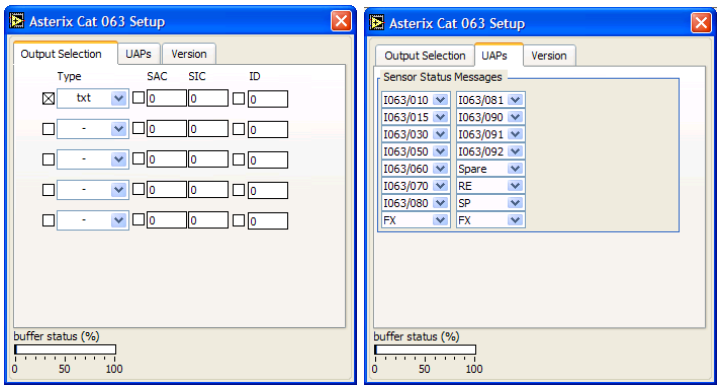


Figure 6-60: AsterixCat063Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output. In a similar way, filtering on the “ID” can be done.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAPs” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.1 is implemented.

6.27 AsterixCat065Convert

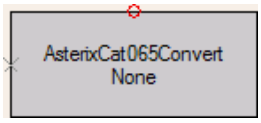


Figure 6-61: AsterixCat065Convert software component symbol

Purpose: Convert ASTERIX CAT065 (SDPS Service Status Messages) digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX CAT065 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the AsterixCat065Convert configuration screen.
Supported output formats are: text, EDR, status and replay.
Outputs are numbered clockwise starting with the top leftmost blue X.
Event output generates event data (North, Sector crossing, Sector 0).

Configuration: Double click the AsterixCat065Convert software component symbol in the session configuration diagram. Following dialog is shown:

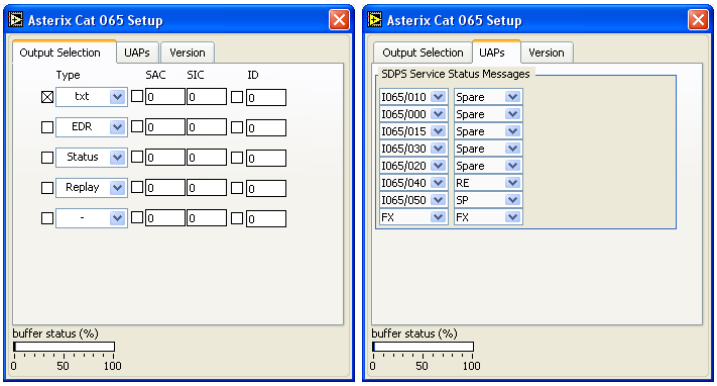


Figure 6-62: AsterixCat065Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the checkbox next to the “SAC” and “SIC” fields to filter the output data on SAC and SIC code. When this option is selected only the data from the matching SAC and SIC code as provided in the “SAC” and “SIC” Fields is converted for this output.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Click on the “UAPs” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields.

Click on the “Version” tab to select the correct version of the ASTERIX category according to the Eurocontrol specifications. Version 1.2 is implemented.

6.28 AsterixCatSplitter

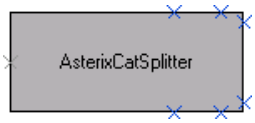


Figure 6-63: AsterixCatSplitter software component symbol

Purpose: This component is necessary to process multiple ASTERIX **messages** (belonging to the same or different ASTERIX category) in a protocol frame.
For example, an UDP- or TCP-frame (OSI Transport Layer) can contain multiple ASTERIX messages.
Another example: an U-HDLC-frame (OSI Data Link Layer) can also contain multiple ASTERIX messages.
In order to split the data in these protocol frames into individual ASTERIX **messages**, the ASTERIXCatSplitter is used.
Remark: The module does not split an ASTERIX message into different **records**. This is done in the different ASTERIX protocol converts. (For more information, refer to the ASTERIX structure, reference [4])

Even in the case when only one ASTERIX category is present in the data field, it is still recommended to use the ASTERIXCatSplitter because more than one ASTERIX message of the same category can be found in one protocol frame.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean ASTERIX data without the presence of transport protocol framing data.

Outputs: Up to 6 outputs, each output has an associated ASTERIX Category. Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the AsterixCatSplitter software component symbol in the session configuration diagram. Following dialog is shown:

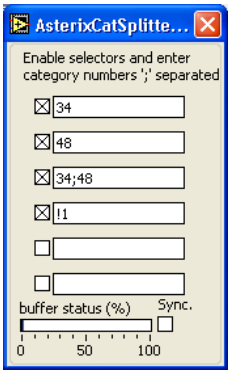


Figure 6-64: AsterixCatSplitter Configuration interface

Click on the checkbox next to the Category specification field. Enter a category number in the Category specification field. If multiple categories are required on a channel, type the category numbers consecutive and separated with a “;”. Alternatively, when you fill in “!” with a category number, you will let pass all data except that category. For example: !1 means that all categories will pass this channel except category 1.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Click on the “Sync” checkbox to enable internal package numbering. This is useful to restore the message sequencing after further processing. Due to the multitasking nature of the DHM it is possible that not all message types are processed equally fast, i.e. target messages might take longer to process than sector messages, when converted data streams are later on merged together it is possible that the original package sequence is lost. To prevent this you may number all the packages with the “Sync” checkbox so the original message flow may be restored with the “Synchronize Ack” message re-sequencer.

Use the “Sync” option in combination with the “Synchronize Ack” software component.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Status: Right click the AsterixCatSplitter software component symbol in the session configuration diagram. Following dialog is shown:

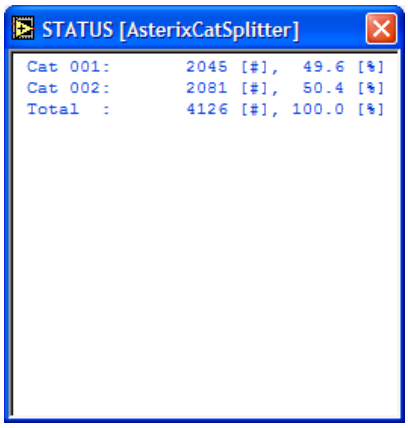


Figure 6-65: AsterixCatSplitter status

The status display shows how many data packets (in number and percentage) are sent in a split category.

6.29 AsterixPacketizer

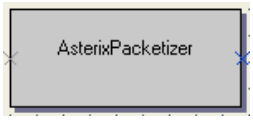


Figure 6-66: AsterixPacketizer software component symbol

Purpose: Packetize ASTERIX byte-stream. Builds clean ASTERIX EDR-V2 records from byte-stream information. Byte-stream sources include Comm ports and TCP/IP.

Care must be taken that the information captured via a byte-stream input starts with the first byte of an ASTERIX record. If the first byte captured is not the first byte of an ASTERIX record the DHM could lock-up in an endless loop or produce unpredictable results.

Inputs: Single input accepts data in byte-stream format. This means that the data presented must be clean ASTERIX data without the presence of transport protocol framing data.

Outputs: One output. Packetized ASTERIX data in EDR-V2 format.

Configuration: Double click the AsterixPacketizer software component symbol in the session configuration diagram. Following dialog is shown:

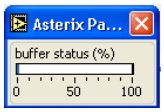


Figure 6-67: Asterix Packetizer Configuration interface

No configuration is needed; the “buffer status” indicator shows the component’s input FIFO buffer fill status.

Status: Right click the AsterixPacketizer software component symbol in the session configuration diagram to select status. Following dialog is shown:

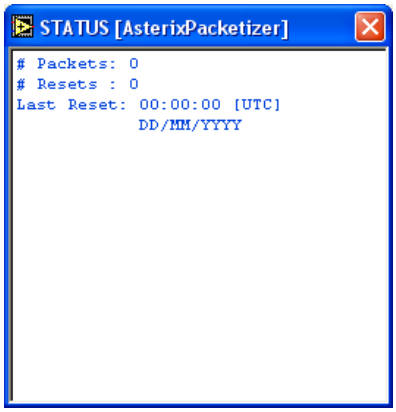


Figure 6-68: AsterixPacketizer status

The status display shows how many data packets where processed and how many times and when it last received a reset from the COMM port or TCP/IP module.

Resets could have caused loss of data. If number of resets is high this could indicate a malfunctioning or overloaded connection.

6.30 Beat

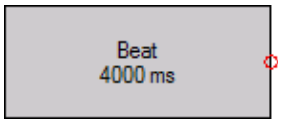


Figure 6-69: Beat software component symbol

Purpose: This software component generates a beat.

Inputs: No input available.

Outputs: One output that can be connected to an event node of a software component. For example: S4 recorder, D6 recorder, IRD recorder.

Configuration: Double click the Beat software component symbol in the session configuration diagram. Following dialog is shown:

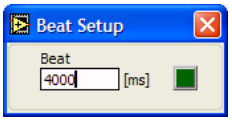


Figure 6-70: Beat Configuration interface

Fill in the clock value in milliseconds. Everytime the module sends a beat, the LED flashes green.

6.31 CD-2CConvert

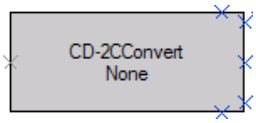


Figure 6-71: CD-2c Convert Software Module symbol

Purpose: Converts CD-2C digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts clean CD-2C data.

Outputs: Five output channels. CD-2C data in D6, text, vector or EDR format. Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the CD-2C software component symbol in the session configuration diagram. Following dialogs are shown:

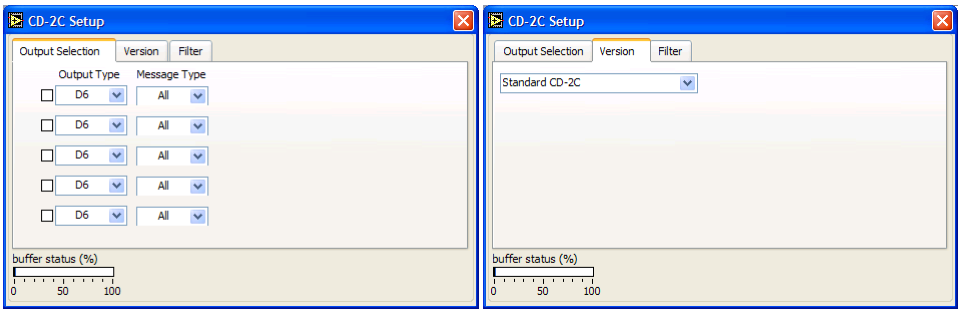


Figure 6-72: CD-2Convert configuration interface

Output selection: 5 output channels can be selected. For each channel, select the appropriate output type: D6, txt or EDR. Choose the appropriate message type for every enabled channel to filter on: Status/Target/Weather/Strobe/Map or All messages

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

Version: Select the correct version of CD-2C: Standard or LRR

Filter: disabled, future development

Buffer status: shows the component's input FIFO buffer fill status.

6.32 COMMInput

Figure 6-73: COMMInput software component symbol

Purpose: Hardware interface with standard Windows COMM ports. Typically used for asynchronous data acquisition. The Software components are enumerated within the square brackets. There will be as many COMMInput modules as there are available Windows COMM ports.

COMMInput modules can only be instantiated once and are mutually exclusive with COMMOutput modules.

Inputs: None, direct interface with system drivers.

Outputs: One output, byte-stream of characters received on the COMM port.

Configuration: Double click the COMMInput software component symbol in the session configuration diagram. Following dialog is shown:

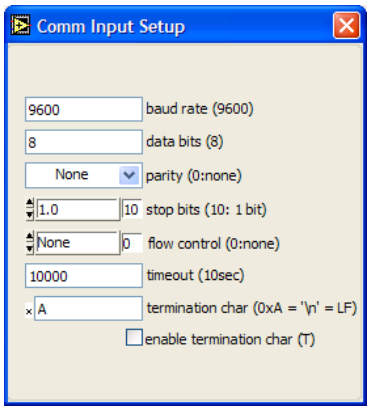


Figure 6-74: COMMInput Configuration interface

Baud rate is the rate of transmission. The default is 9600.

Data bits is the number of bits in the incoming data. The value of data bits is between five and eight. The default value is 8.

Parity specifies the parity used for every frame to be transmitted or received.

0 No parity (default)
1 Odd parity
2 Even parity
3 Mark parity
4 Space parity

Stop bits specifies the number of stop bits used to indicate the end of a frame.

10 1 stop bit
15 1.5 stop bits
20 2 stop bits

Flow control sets the type of control used by the transfer mechanism.

Type	Explanation
0	None(default)- The transfer mechanism does not use flow control. Buffers on both sides of the connection are assumed to be large enough to hold all data transferred.
1	XON/XOFF- The transfer mechanism uses the XON and XOFF characters to perform flow control. The transfer mechanism controls input flow by sending XOFF when the receive buffer is nearly full, and it controls the output flow by suspending transmission when XOFF is received.
2	RTS/CTS- The transfer mechanism uses the RTS output signal and the CTS input signal to perform flow control. The transfer mechanism controls input flow by unasserting the RTS signal when the receive buffer is nearly full, and it controls output blow by suspending the transmission when CTS signal is unasserted.
3	XON/XOFF and RTS/CTS—The transfer mechanism uses the XON and XOFF characters and the RTS output signal and CTS input signal to perform flow control. The transfer mechanism controls input flow by sending XOFF and unasserting the RTS signal when the receive buffer is nearly full, and it controls the output flow by suspending transmission when XOFF is received and the CTS is unasserted.
4	DTR/DSR—The transfer mechanism uses the DTR output signal and the DSR input signal to perform flow control. The transfer mechanism controls input flow by unasserting the DTR signal when the receive buffer is nearly full, and it controls output flow by suspending the transmission when the DSR signal is unasserted
5	XON/XOFF and DTR/DSR—The transfer mechanism uses the XON and XOFF characters and the DTR output signal and DSR input signal to perform flow control. The transfer mechanism controls input flow by sending XOFF and unasserting the DTR signal when the receive buffer is nearly full, and it controls the output flow by suspending transmission when XOFF is received and the DSR signal is unasserted.

Timeout sets the timeout value for the write and read operations.

Termination char calls for termination of the read operation. The read operation terminates when **termination char** is read from the serial device. 0xA is the hex equivalent of a linefeed character (\n). Change the **termination char** to 0xD for message strings that terminate with a carriage return (\r).

Enable termination char prepares the serial device to recognize **termination char**. If checked (default), the device is set to recognize the termination character. If unchecked the device does not recognize the termination character.

The *COMMInput module is only available when a COM-port is installed in the computer. It is also necessary to install the VisaRuntime engine to make the COM-port visible in the DHM. (Can be found on the RASS-R installation DVD, folder "Prerequisites", "VISA", "visa410runtime.exe".*

6.33 COMMOutput

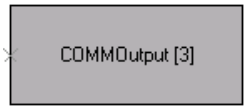


Figure 6-75: COMMOutput software component symbol

Purpose: Hardware interface with standard Windows COMM ports. Typically used for asynchronous data acquisition. The Software components are enumerated within the square brackets. There will be as many COMMOutput modules as there are available Windows COMM ports.

COMMOutput modules can only be instantiated once and are mutually exclusive with COMMInput modules.

Inputs: Single input accepts data in EDR V2 format.

Outputs: None, direct interface with system drivers.

Configuration: Double click the COMMOutput software component symbol in the session configuration diagram. Following dialog is shown:

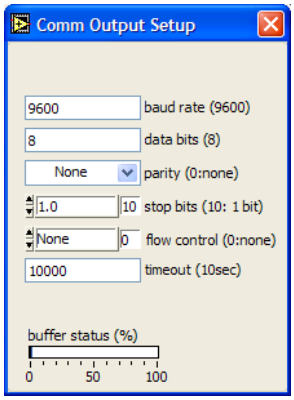


Figure 6-76: COMMOutput Configuration interface

Baud rate is the rate of transmission. The default is 9600.

Data bits are the number of bits in the incoming data. The value of data bits is between five and eight. The default value is 8.

Parity specifies the parity used for every frame to be transmitted or received.

0 No parity (default)
1 Odd parity
2 Even parity
3 Mark parity
4 Space parity

Stop bits specifies the number of stop bits used to indicate the end of a frame.

10 1 stop bit
15 1.5 stop bits
20 2 stop bits

Flow control sets the type of control used by the transfer mechanism.

Mode	Explanation
0	None(default)- The transfer mechanism does not use flow control. Buffers on both sides of the connection are assumed to be large enough to hold all data transferred.
1	XON/XOFF- The transfer mechanism uses the XON and XOFF characters to perform flow control. The transfer mechanism controls input flow by sending XOFF when the receive buffer is nearly full, and it controls the output flow by suspending transmission when XOFF is received.
2	RTS/CTS- The transfer mechanism uses the RTS output signal and the CTS input signal to perform flow control. The transfer mechanism controls input flow by unasserting the RTS signal when the receive buffer is nearly full, and it controls output blow by suspending the transmission when CTS signal is unasserted.
3	XON/XOFF and RTS/CTS—The transfer mechanism uses the XON and XOFF characters and the RTS output signal and CTS input signal to perform flow control. The transfer mechanism controls input flow by sending XOFF and unasserting the RTS signal when the receive buffer is nearly full, and it controls the output flow by suspending transmission when XOFF is received and the CTS is unasserted.
4	DTR/DSR—The transfer mechanism uses the DTR output signal and the DSR input signal to perform flow control. The transfer mechanism controls input flow by unasserting the DTR signal when the receive buffer is nearly full, and it controls output flow by suspending the transmission when the DSR signal is unasserted
5	XON/XOFF and DTR/DSR—The transfer mechanism uses the XON and XOFF characters and the DTR output signal and DSR input signal to perform flow control. The transfer mechanism controls input flow by sending XOFF and unasserting the DTR signal when the receive buffer is nearly full, and it controls the output flow by suspending transmission when XOFF is received and the DSR signal is unasserted.

Timeout sets the timeout value for the write and read operations.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

The *COMMOutput module is only available when a COM-port is installed in the computer. It is also necessary to install the VisaRuntime engine to make the COM-port visible in the DHM. (Can be found on the RASS-R installation DVD, folder “Prerequisites”, ”VISA”, “visa410runtime.exe”.*

6.34 D6Filter

Figure 6-77: D6Filter

Purpose: Filters on D6 data messages.

Inputs: Single input accepts data in D6 format.

Outputs: Single output in D6 format.

Configuration: Double click the D6Filter software component symbol in the session configuration diagram. Following dialogs are shown:

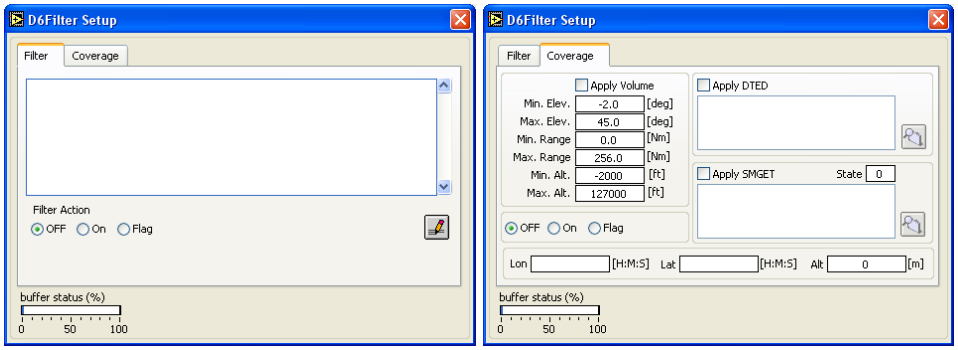


Figure 6-78: D6Filter Configuration interface

Filter: Filter on the D6 messages by opening the filter editor (Similar as in AsterixCat001Convert). This filter engine is the same as the G-filter in the MRD3!

The following filter actions are possible:
Off: Filter is disabled
On: Filter is enabled
Flag: D6-messages that pass the filer are flagged (Flag can be interpreted in the MRD3 or TRACKAN).

Coverage: You can filter on 3 coverage related items, by enabling the appropriate radio buttons:

Volume: define the volume in Elevation/Range and Altitude
DTED: load screening files (.hrscr created by the Coverage Map Calculator). Only D6-messages in coverage will pass the filter.
SMGET: load SMGET screening files. Only D6-messages in coverage will pass the filter.

The logical relation between the Volume/DTED and SMGET filter is an AND-condition.

The filter conditions are the same again: **Off/On/Flag**.

Longitude, **Latitude** and **Altitude** need to be filled in to know the screening files centre points.

Buffer status: indicator shows the component's input FIFO buffer fill status.

First the Filter-tab is executed, then the Coverage tab!

Status: Right click the D6Filter software component symbol in the session configuration diagram to select status. Following dialog is shown:

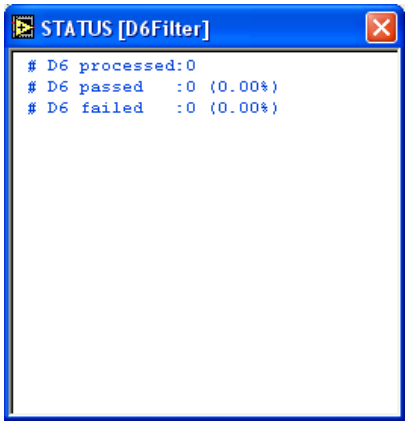


Figure 6-79: D6Filter status

The status display shows the number and percentage of D6 data packets processed, passed and filtered out.

6.35 D6Manipulation

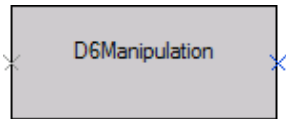


Figure 6-80: Data manipulation

Purpose: Change real time data information fields in a D6 stream.

Inputs: Single input accepts data in D6 format.

Outputs: Single output in D6 format.

Configuration: Double click the D6Manipulation software component symbol in the session configuration diagram. Following dialogs are shown:

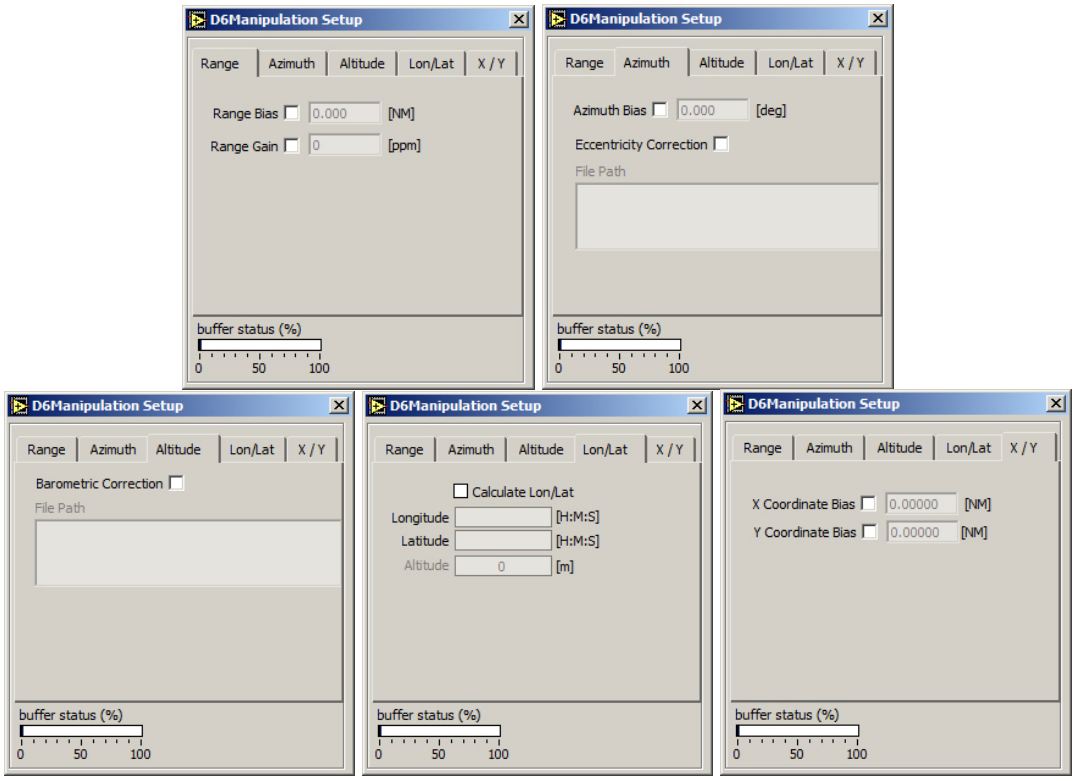


Figure 6-81: D6Manipulation Configuration interface

Range: Enable Range Bias and fill in the correction in [+/-NM] with a precision of 0.001NM. Range bias is only changed for X/Y or Range/Azimuth data. (Not for Lon/Lat data)
Enable Range Gain and fill in the correction in [+/-ppm].

Azimuth: Enable Azimuth Bias and fill in the correction in [+/-deg] with a precision of 0.001deg.
You can also use eccentricity correction based on a RASS-S processed eccentricity file.

Altitude: Enable Barometric Correction, based on a barometric sounding file.

Lon/Lat: Enable Calculate long/lat and fill in the position of the radar. It will calculate and add the long/lat based on the range/azimuth data.

X/Y: Enter the desired bias for X and/or Y in degrees.
Use the checkboxes to select if you want to apply the bias.

Buffer status: indicator shows the component's input FIFO buffer fill status.

Status: Right click the D6Manipulation software component symbol in the session configuration diagram to select status. Following dialog is shown:

Figure 6-82: D6Manipulation status

The status display shows the number of D6 data packets that where processed.

6.36 D6Recorder

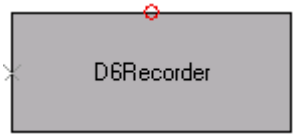


Figure 6-83: D6Recorder software component symbol

Purpose: Record D6 information onto disk. Recording can group D6 records together and archive recordings based on the configuration settings. D6 information is used as a RASS-R inter-application data exchange format. D6 recordings can mainly be used in the TRACKAN and Radar Comparator Mono/Dual.
A D6-file is recorded in a folder with the same name as the D6-files.
All D6-files (folders) are recorded in the folder as specified in the Destination Path. (There is no grouping of folders per day as in the EDRRecorder.) See also the example at the end of this section.
You can change the name of the D6-file afterwards, though the name of the folder and file must be the same!

Inputs: Single input accepts data in D6 format from multiple sources. This means that more than one source may be configured; the data is then combined into a single recording. Event input accepts event data (North, Sector crossing, Sector 0).

Outputs: None, stores .D6 output files on disk.

Configuration: Double click the D6Recorder software component symbol in the session configuration diagram. Following dialog is shown:

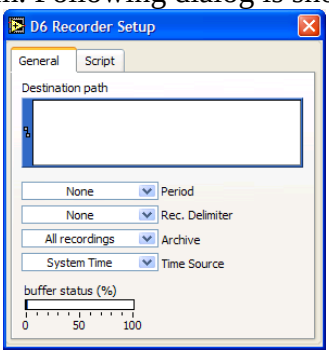


Figure 6-84: D6Recorder Configuration interface

Destination path: Enter a destination path; this is the **full path to the directory** in which you wish to store the recordings.

The files are stored on the machine where the DHM background server is running.

Period: Select a Period ranging from 1min to 3months to specify the file size. Recordings are stored in chunks of **period** size, select “none” for continuous recoding in one data file.

Rec. Delimiter: D6 Records can be grouped together in the recording file based on the delimiter setting.

None	Each D6 record is stored as a separate entity in the recording.
ARP (Event)	D6 records are grouped together in the recording based on ARP events.
North (Event)	D6 records are grouped together in the recording based on North events.
Sect 0 (Event)	D6 records are grouped together in the recording based on Sect 0 events.
Time (Event)	D6 records are grouped together in the recording based on Time events.
North (D6)	D6 records are grouped together in the recording based on North messages in the D6 data stream.
Sect 0 (D6)	D6 records are grouped together in the recording based on Sect 0 messages in the D6 data stream.

Make sure that an Event Source is configured when using an event as delimiter.

Archive: When using a specific **period** the **archive** setting specifies how many recording files will be kept on disk, ranging from 1 to 5000 recordings. Old recordings will be deleted to make place for new ones. Select “All recordings” if no recordings are to be removed.

Time Source: Build file names with the current **system time** or with the **time of recording** information. When system time is selected the current UTC time will be used, with the condition that the time zone of the computer is correctly set. See also time keeper note explained in the beginning of heading 6.

Buffer status: indicator shows the component’s input FIFO buffer fill status.

Status: Right click the D6Recorder software component symbol in the session configuration diagram. Following dialog is shown:

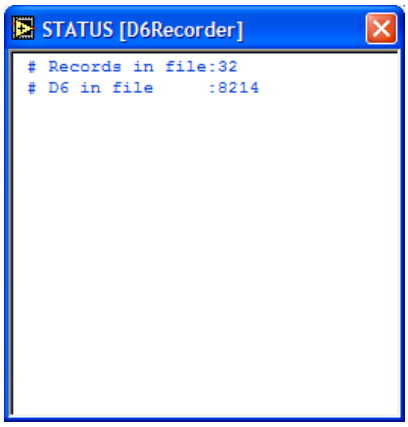


Figure 6-85: D6Recorderd status

The status display shows how many records are recorded in the D6-file and how many D6 messages are recorded. (A record can contain multiple D6 messages as defined in the Record Delimiter: when this is set to <none>, the number of “Records in file” and “D6 in file” will be the same!)

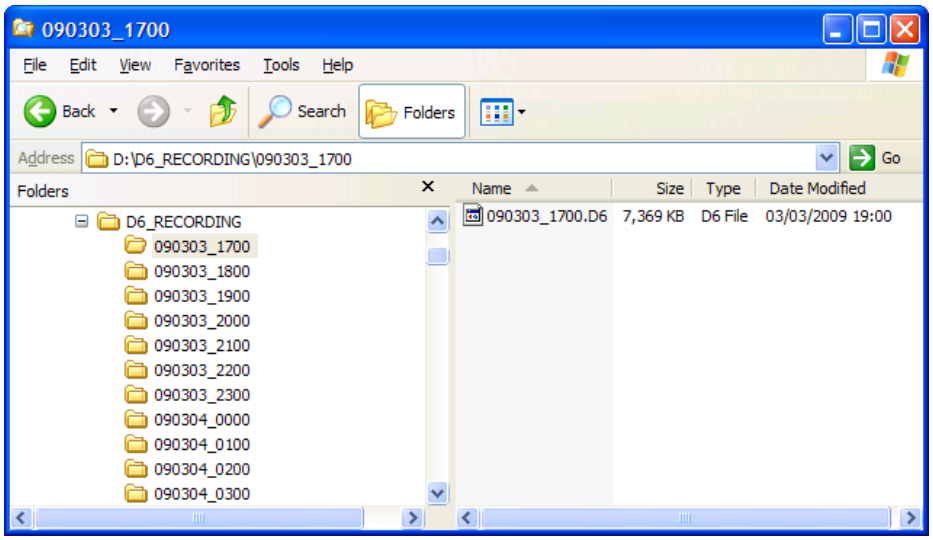


Figure 6-86: Example of a D6 recorder file structure

6.37 D6Replay

Figure 6-87: D6Replay Software component symbol

Purpose: Replay (read) a D6 recording from disk. Previously captured data is played back with the option of increasing playback speed, replay only a subsection and replay continuous loop.

Inputs: None, reads files from disk. Files must be in D6 format.

Outputs: One output. Data is output in D6 format.
The event output replays event data (North, Sector crossing, Sector 0).

Configuration: Double click the D6Replay software component symbol in the session configuration diagram. Following dialog is shown:

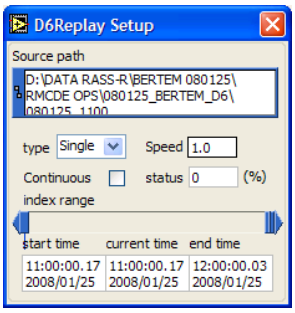


Figure 6-88: D6Replay Configuration interface

Source path: Enter a Source path; this is the **full path to the directory** from which you wish to retrieve the recording. When the file is correctly loaded, you will see a start and end time filled in.

The files are stored on the machine where the DHM background server is running.

Type: When type is set to Single, one can choose the replay speed for the recording: 1 (default) means as recorded, 2 means twice as fast, use 0.5 to playback at half the recording speed, etc. When speed is set to **0** the D6 replay module will replay as fast as possible.
When type is set to Block, a fixed block length is used for replay.

All DHM modules use buffer overflow protection. So, even when set to max. speed, the replay module will pause replay each time the input buffer of a connected module runs full. Because of this pausing, a well chosen speed can be faster than speed set to 0.

Index range: Select start and stop position in the recording (default all) to enable partial playback.

Replay status (%): Gives an indication in % of the number of D6-messages replayed.

Start time: Shows the recording timestamp from which playback will be started, adjust the **index range** start slider to select a different start time.

End time: Shows the recording timestamp at which the playback will stop, adjust the **index range** end slider to select a different end time.

Current time: Shows the recording timestamp of the current record being played back.

Continuous loop: When true the playback cycle is never stopped, when a recording has reached its end time the playback will start again from the start time in endless loop.

6.38 D6ToCat034-048

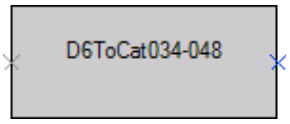


Figure 6-89: D6ToCat034 software component symbol

Purpose: Converts D6 data messages to ASTERIX CAT034 and 048.

Inputs: Single input accepts data in D6 format.

Outputs: Data messages in ASTERIX CAT034 and CAT048 format. (EDR)

Configuration: Double click the D6ToCat034-048 software component symbol in the session configuration diagram. Following dialog is shown:

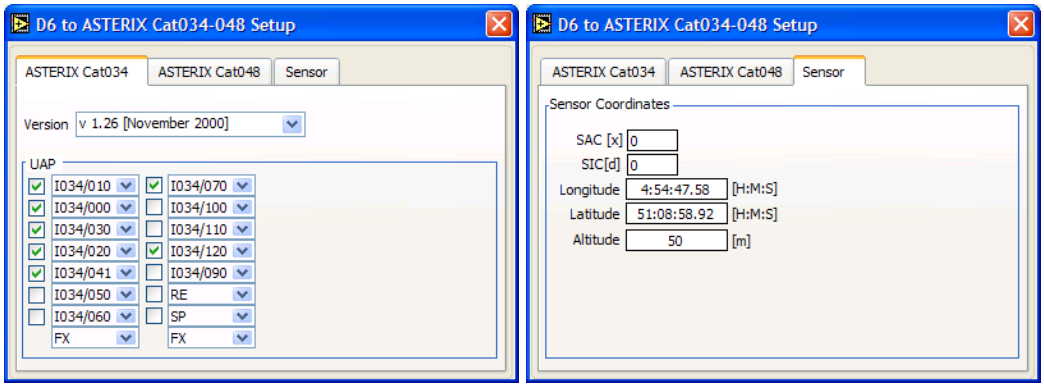


Figure 6-90: D6ToCat034-048 Configuration interface

Click on the “ASTERIX CAT034” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields. Select the correct version of the ASTERIX CAT034 according to the Eurocontrol specifications. Version 1.26 is implemented.

Click on the “ASTERIX CAT048” tab on top of the configuration window to edit the assignment of Data Items to the corresponding Data Fields. Select the correct version of the ASTERIX CAT048 according to the Eurocontrol specifications. Version 1.14 is implemented.

Click on the “Sensor” tab on top of the configuration window to edit to fill in the SAC/SIC code and the radar’s position longitude, latitude and altitude that will be used in the ASTERIX CAT034 message. (On the condition that these fields are enabled in the UAP’s)

6.39 D6toRSRP

Figure 6-91: D6toRSRP software component symbol

Purpose: Converts D6 digital data messages to RSRP.

Inputs: Single input accepts data in D6 format.

Outputs: Data messages in RSRP format.

Configuration: Double click the D6ToRSRP software component symbol in the session configuration diagram. Following dialog is shown:

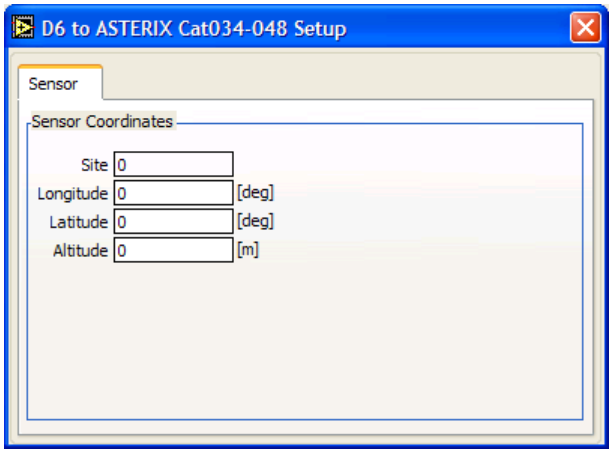


Figure 6-92: D6toRSRP Configuration Interface

Sensor Coordinates: Not used.

6.40 D6ToS4

Figure 6-93: D6toS4 Software component symbol

Purpose: Converts D6 data messages to S4. S4 data can be used in other software tools, for example in the RASS-S Inventory tool or in the RASS-R Radar Comparator Mono/Dual.

Inputs: Single input accepts data in D6 format.

Outputs: Data messages in S4 format. (For example to send it to the S4-recorder)

Configuration: Double click the D6ToS4 software component symbol in the session configuration diagram. Following dialog is shown:

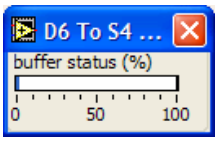


Figure 6-94: D6ToS4 Configuration interface

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

Status: Right click the D6ToS4software component symbol in the session configuration diagram. Following dialog is shown:

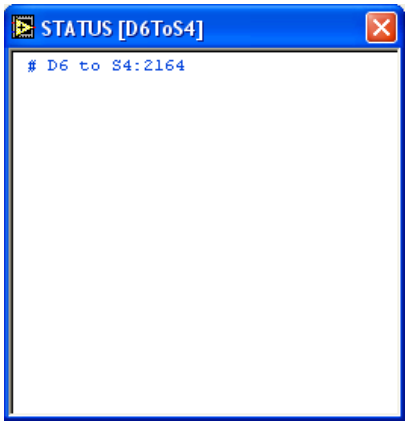


Figure 6-95: D6ToS4 status

The status display shows how many records are converted from D6 to S4.

S4 Probe: If you select probe on the output arrow following dialog opens.

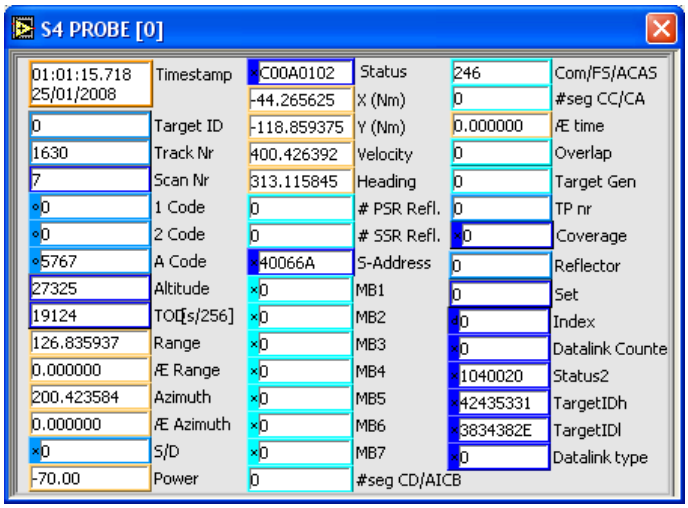


Figure 6-96: S4 probe

6.41 Data manipulation

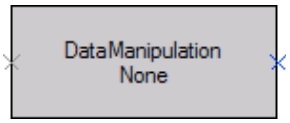


Figure 6-97: D6 Manipulation software component symbol

Purpose: Manipulates an EDR V2.0 data stream in real time.

Inputs: Single input accepts data in EDR V2.0 format.

Outputs: Single output in EDR V2.0 format.

Configuration: Double click the DataManipulation software component symbol in the session configuration diagram. Following dialogs are shown:

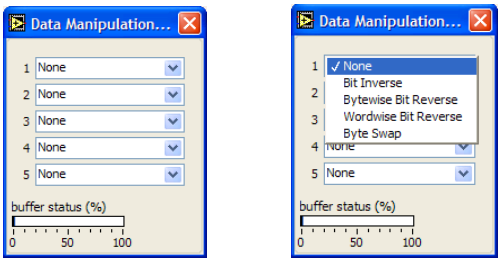


Figure 6-98: Data Manipulation configuration interface

This module allows manipulating the data in the following ways:

Bit Inverse:	all bits are inverted. (0 becomes 1 and vice versa)
Bytewise Bit Reverse:	all bits in one byte change position (bit 0 becomes bit 7, bit 1 becomes bit 6 etc.)
Wordwise Bit Reverse:	all bits in one word change position
Byte Swap:	two bytes in one word are swapped (byte 0 becomes byte 1 and vice versa)

These actions can be executed 5 times, taken into account that first Data Manipulation 1 is executed, then Data Manipulation 2 etc.

For example:

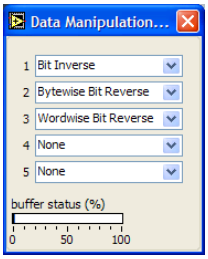


Figure 6-99: Example Data Manipulation

The “buffer status” indicator shows the component’s input FIFO buffer fill status

6.42 DataTrimmer

Figure 6-100: DataTrimmer software component symbol

Purpose: Strip a number of header and footer bytes so that only valid information frames remain.

Inputs: Single input accepts data in EDR V2.0.

Outputs: One output. Data in EDR V2.0 format stripped as defined in the setup.

Configuration: Double click the DataTrimmer software component symbol in the session configuration diagram. Following dialog is shown:

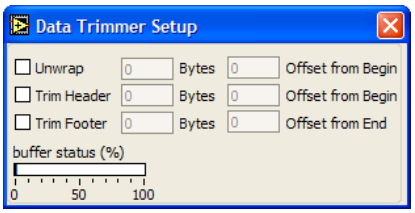


Figure 6-101: DataTrimmer Configuration interface

Check the respective checkboxes to strip a header and/or footer.
Give in the number of bytes to strip and the offset in bytes from begin or from end.

By enabling the Unwrap functionality, you have the possibility to read out the length of a data packet and to make separate data packets based on this information.

For example: suppose that a UDP packet contains different ASTERIX CAT001 packets one after each other. Knowing that in ASTERIX, there is a 2 byte length description with a 1 byte offset from the beginning, the Data Trimmer can read this length and cut the different ASTERIX CAT001 messages inside this UDP packet. In this way the "long" UDP packet can be unwrapped in different ASTERIX CAT001 messages.

The "buffer status" indicator shows the component's input FIFO buffer fill status

6.43 EADSConvert

Figure 6-102: EADSConvert software component symbol

Purpose: Convert EADS PEX/ST digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean EADS PEX/ST data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the EADSConvert configuration screen. As output, D6 format and text format are supported. Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the EADSConvert software component symbol in the session configuration diagram. Following dialog is shown:

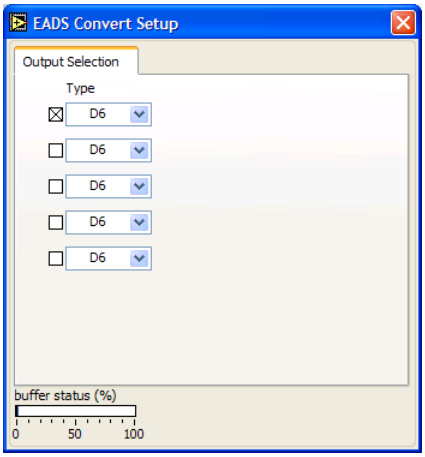


Figure 6-103: EADSConvert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.44 EADS

Figure 6-104: EADS software component symbol

Purpose: Packetize EADS PEX/ST bytestream. Builds clean EADS PEX/ST EDR-V2 records from bytestream information. Bytestream sources include Comm ports and TCP/IP.

Care must be taken that the information captured via a bytestream input starts with the first byte of an EADS PEX/ST record. If the first byte captured is not the first byte of an EADS Pex/ST record the DHM could lock-up in an endless loop or produce unpredictable results.

Inputs: Single input accepts data in byte-stream format. This means that the data presented must be clean EADS PEX/ST data without the presence of transport protocol framing data.

Outputs: One output. Packetized EADS PEX/ST data in EDR-V2 format.

Configuration: Double click the EADS software component symbol in the session configuration diagram. Following dialog is shown:

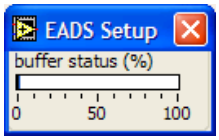


Figure 6-105: EADS Configuration interface

No configuration is needed, the “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.45 EDRRecorder

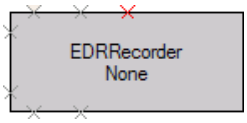


Figure 6-106: EDRRecorder software component symbol

Purpose: Record EDR information onto disk. Recording can group EDR records together and archive recordings based on the configuration settings.
An .EDR-file is recorded in a folder with the same name as the .EDR-file.
All .EDR-files (folders) are recorded in the folder as specified in the Destination Path, grouped together per day (24hours). See also the example at the end of this section.
An .EDR-file must always be accompanied by its index-file .idx. [Reference 2]
You can change the name of the .EDR- and .idx-file, though they must be the same as the foldername!

Inputs: 6 Sources can be accepted as input. This means that more than one source may be configured; the data is then combined into a single recording.
Event input accepts ACP/ARP/PPS. (On line 0)

Outputs: None, stores output files on disk.

Configuration: Double click the Recorder software component symbol in the session configuration diagram. Following dialog is shown:

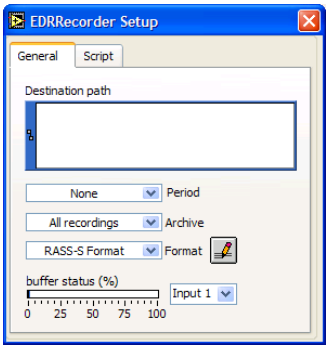


Figure 6-107: Recorder Configuration interface

Destination path: Enter a destination path; this is the **full path to the directory** in which you wish to store the recordings.

The files are stored on the machine where the DHM background server is running.

Period: Select a Period ranging from 1min to 3months to specify the file size. Recordings are stored in chunks of **period** size, select “none” for continuous recoding in one data file.

Archive: When using a specific **period** the **archive** setting specifies how long recording files will be kept on disk, ranging from 1 day to 10 years. Old recordings will be deleted to make place for new ones. Select “All recordings” if no recordings are to be removed.

Format: Choose RASS-S compatible format for the recording.

Buffer status: indicator shows the component's input FIFO buffer fill status.

The following setup is only necessary when the recording will be analyzed further in RASS-S.

When you click the pencil button, the following dialog will open:

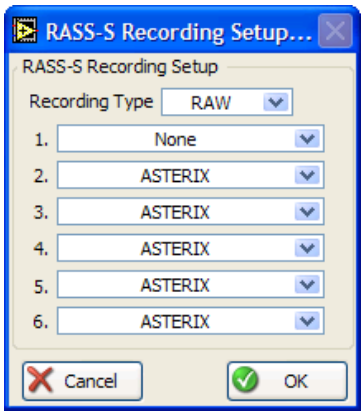


Figure 6-108: Recording setup

Recording Type: For the recording, select the appropriate recording type:

Raw (default)	the data is bitwise recorded, without respect of protocol framings
EDR/UDR	when the data is input from the EDR or UDR
TCP/UDP	when the data is input from a data stream over TCP or UDP

Type of data: Select the type of data for every input line. Following data types are implemented:
Asterix (default)
RDIF
DDE
EADS SIP-PEX
EADS PEX-ST
RSRP
LINK-1
RIS CLF
RIS RSRP
RIS RAT31DL
Radar RAT31DL

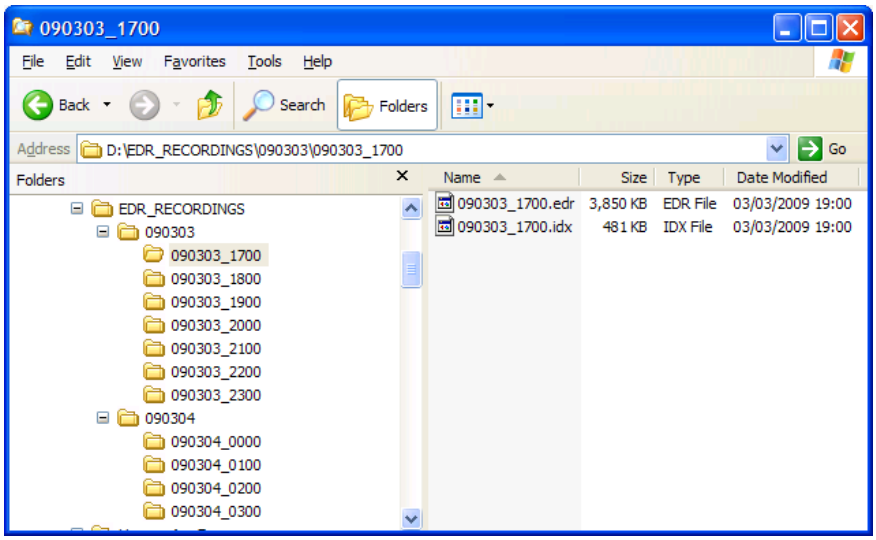


Figure 6-109: Example of an EDR recorder file structure

Status: Right click the EDRRecorder software component symbol in the session configuration diagram. Following dialog is shown:

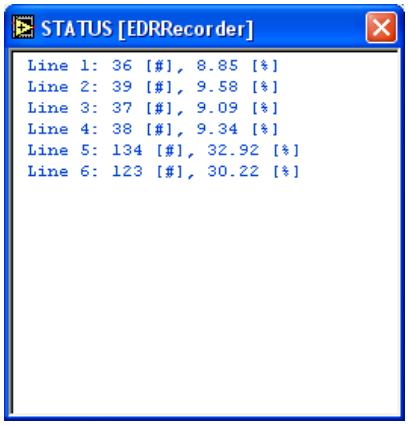


Figure 6-110: EDRRecorder status

The status display shows how many data packets (in number and percentage of the total over all channels) are recorded on each of the 6 channels.

6.46 EDRReplay

Figure 6-111: EDRReplay software component symbol

Purpose: Replay (read) an EDR recording from disk. Previously captured data is played back as it was recorded with the option of increasing playback speed, replay only a subsection and replay in continuous loop.

Inputs: None , reads files from disk. Files must be in EDR V2.0 or EDR V1.0 format.

Outputs: Six outputs, to mimic the EDR hardware device. One output per recorded line. Data is output in EDR V2.0 format.
The event output (O) replays event data (North, Sector crossing, Sector 0).
The event output (X) replays ACP/ARP/PPS.

Configuration: Double click the EDRReplay software component symbol in the session configuration diagram. Following dialog is shown:

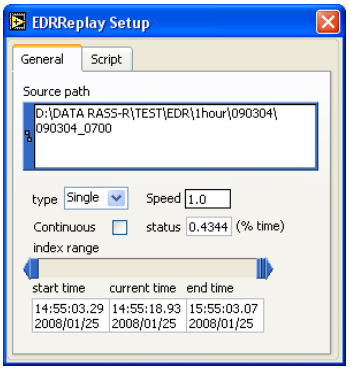


Figure 6-112: EDRReplay Configuration interface

Source path: Enter a Source path; this is the **full path to the directory** from which you wish to retrieve the recording. When the file is correctly loaded, you will see a start and end time filled in.

The files are stored on the machine where the DHM background server is running.

Type: When type is set to Single, one can choose the replay speed for the recording: 1 (default) means as recorded, 2 means twice as fast, use 0.5 to playback at half the recording speed, etc. When speed is set to **0** the EDRreplay module will replay as fast as possible.
When type is set to Block, a fixed block length is used for replay.

All DHM modules use buffer overflow protection. So, even when set to max. speed, the replay module will pause replay each time the input buffer of a connected module runs full. Because of this pausing, a well chosen speed can be faster than speed set to 0.

Index range: Select start and stop position in the recording (default all) to enable partial playback.

Replay status (%): Gives an indication in % of the number of messages replayed.

Start time: Shows the recording timestamp from which playback will be started, adjust the **index range** start slider to select a different start time. It is also possible to set the different times by using the “set Time and Date” dialog:

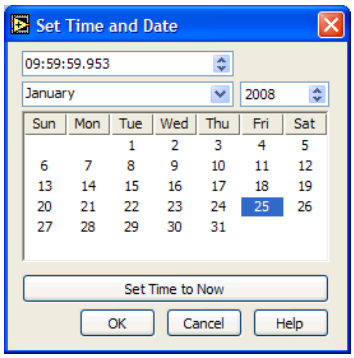


Figure 6-113: EDRReplay time adjustment

End time: Shows the recording timestamp at which the playback will stop, adjust the **index range** end slider to select a different end time.

Current time: Shows the recording timestamp of the current record being played back.

Continuous loop: When true the playback cycle is never stopped, when a recording has reached its end time the playback will start again from the start time in endless loop.

Status: Right click the EDRReplay software component symbol in the session configuration diagram. Following dialog is shown:

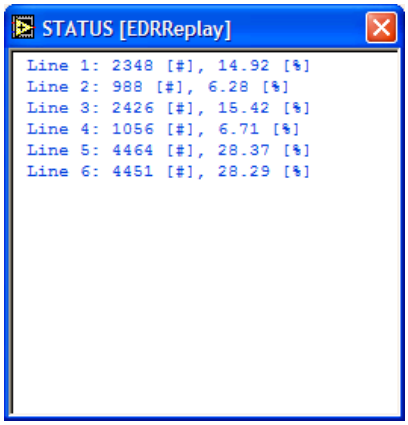


Figure 6-114: EDRReplay status

The status display shows how many data packets (in number and percentage) are replayed on each of the 6 channels.

6.47 EDR

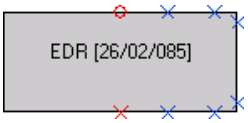


Figure 6-115: EDR software component symbol

Purpose: Interface with hardware EDR679 device. The software components are enumerated within the square brackets; there will be as many EDR modules as there are EDR679 devices connected to the system.

Each EDR module can only be instantiated once.

Inputs: None, direct interface EDR679 device hardware.

Outputs: Six outputs, one per hardware line. Data is output in EDR V2.0 format.
Event output (0) generates event data (North, Sector crossing, Sector 0).
Event output (X) generates event data (ACP/ARP/PPS).

Configuration: Double click the EDR software component symbol in the session configuration diagram. Following dialog is shown:

EDRReplay Setup
Line Config
Mode Type App. Rx Clk Tx Clk Baud
Passive RS232 DTE Ext. Ext. 0
Passive RS232 DTE Ext. Ext. 0
Passive RS422 DTE Ext. Ext. 0
Passive RS422 DCE Ext. Ext. 0
Active RS232 DTE Ext. Ext. 9600
None RS232 DTE Ext. Ext. 0
Special
12 bit (4096)
ACP Input
Refresh
Fast
Slow
Use as Time Keeper (GPS 450 required)

Figure 6-116: EDR Configuration interface

The “Line Config” section allows parameters to be set for each corresponding hardware channel. Lines are numbered from top to bottom starting with line 1.

Mode is the operational mode of the line being configured

None	Line is not configured.
Passive	Used to monitor/view data, clock is provided externally.
Active	For point-to-point connection with active support for transport protocols. Clock is either provided internally or externally, if provided internally also specify the baud rate.
Y-Passive	Used to monitor/view data from 2 lines, typically transmit and receive pair, clock is provided externally.

Type is the hardware type of connection, either RS232 or RS422.

App. is the appearance of the connection, either DTE or DCE.

Rx Clk. Receive Clock source, either externally (Ext.) or internally (Int.).

Tx Clk. Transmit Clock source, either externally (Ext.) or internally (Int.).

Baud. The rate of transmission.

In the “Event Config” section you can specify the number of ACPs per rotation.

Status: Right click the EDRReplay software component symbol in the session configuration diagram. Following dialog is shown:

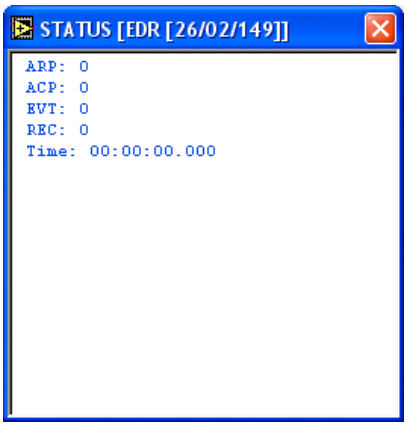


Figure 6-117: EDR status

ARP: Number of received ARP messages

ACP: Number of received ACP messages

EVT: Number of received Events

REC: Number of received records

Time: Time detected

6.48 Ethernet

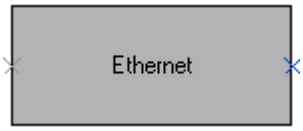


Figure 6-118: Ethernet software component symbol

Purpose: Strip Ethernet transmission protocol headers, may also be configured to strip UDP, TCP and IP transmission protocol headers.

Inputs: Single input accepts data in EDR V2.0 format.

Outputs: One output. Data in EDR-V2 format stripped from the configured transportation protocols.

Configuration: Double click the Ethernet software component symbol in the session configuration diagram. Following dialog is shown:

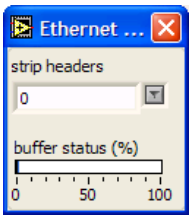


Figure 6-119: Ethernet Configuration interface

Select the transmission protocol which you wish to strip from the “strip headers” drop-down box.

Ethernet	Ethernet headers (14 bytes)
Eth.+ip	Ethernet and IP headers (34 bytes)
Eth.+ip+udp	Ethernet and IP and UDP headers (42 bytes)
Eth.+ip+tcp	Ethernet and IP and TCP headers (62 bytes)

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

You can better use the TransportLayerTrimmer module that gives more flexibility.

6.49 EV760Convert

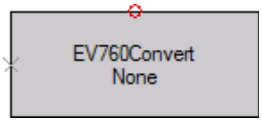


Figure 6-120: EV760Convert Software component symbol

Purpose: Converts EV760 digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean EV760 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the EV760Convert configuration screen. As output, D6 format, text format and EDR V2.0 format are supported. Outputs are numbered clockwise starting with the top leftmost blue X.
Event output generates event data (North, Sector crossing, Sector 0).

Configuration: Double click the EV760Convert software component symbol in the session configuration diagram. Following dialog is shown:

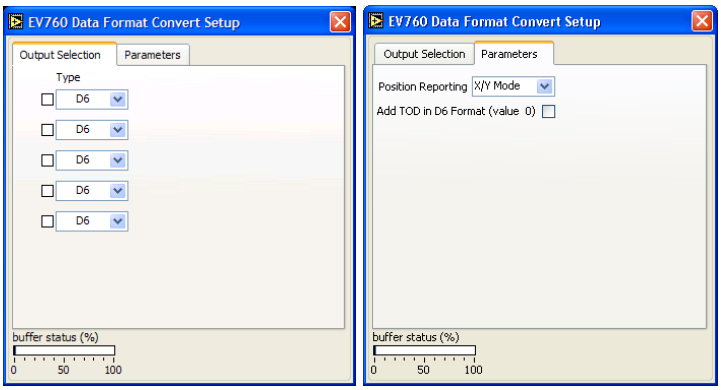


Figure 6-121: EV760Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

In the parameters tab, you can choose between X/Y mode and Range/Azimuth mode for the target position indication.

When “Add TOD in D6 format (value 0)” is selected the Time Of Day field in the D6 formatted data will be 0. Set this only when the RADAR does not output TOD in the EV760 data stream.

6.50 FAANetworkConvert

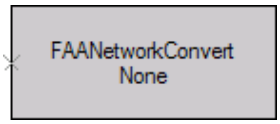


Figure 6-122: FAANetworkConvert software component symbol

Purpose: Convert digital messages FAA Network format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean FAANetwork data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the FAANetworkConvert configuration screen.
Supported output formats are: D6 and text.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the FAANetworkConvert component symbol in the session configuration diagram. Following dialog is shown:

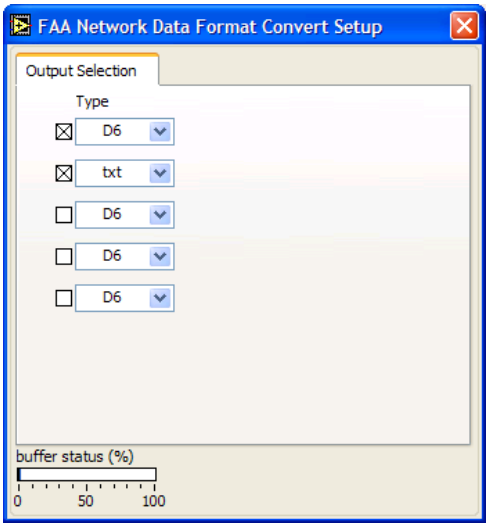


Figure 6-123: FAANetworkConvert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.51 IOSS-Framing

Figure 6-124: IOSS-Framing software component symbol

Purpose: To make the data compatible with the Eurocontrol SASS-C tool. The software component adds the correct header and footer, called the IOSS-framing. [Reference 2]

Inputs: Single input accepts data in raw EDR V2 format.

Outputs: Single output accepts data in raw EDR V2 format.

Configuration: Double click the IOSS-Framing software component symbol in the session configuration diagram. Following dialog is shown:

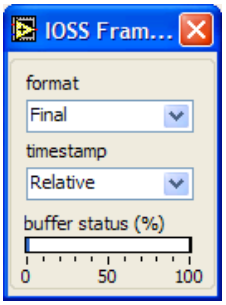


Figure 6-125: IOSS-Framing Configuration interface

Format: choose between Mayer and Final.

Timestamp: choose between relative and absolute.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.52 IRDRecorder

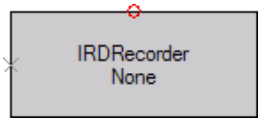


Figure 6-126: IRDRecorder software component symbol

Purpose: Record IRD information onto disk. Recording can group IRD records together and archive recordings based on the configuration settings. IRD information is used as a RASS-S Mode-S analysis format.

Inputs: Single input accepts data in IRD format from multiple sources. This means that more than one source may be configured; the data is then combined into a single recording. Event input accepts event data.

Outputs: None, stores output files on disk.

Configuration: Double click the IRDRecorder software component symbol in the session configuration diagram. Following dialog is shown:

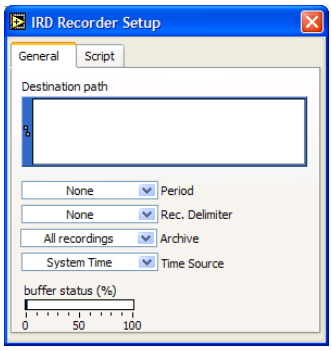


Figure 6-127: IRDRecorder Configuration interface

Destination path: Enter a destination path; this is the **full path to the directory** in which you wish to store the recordings.

The files are stored on the machine where the DHM background server is running.

Period: Select a Period ranging from 1min to 3months to specify the file size. Recordings are stored in chunks of **period** size, select “none” for continuous recoding in one data file.

Rec. Delimiter: IRD Records can be grouped together in the recording file based on the delimiter setting.

Make sure that an Event Source is configured when using this setting.

None	Each IRD record is stored as a separate entity in the recording.
ARP	IRD records are grouped together in the recording based on ARP events.
North	IRD records are grouped together in the recording based on North events.
Sect 0	IRD records are grouped together in the recording based on Sector zero events.
Time	IRD records are grouped together in the recording based on Time events.

Archive: When using a specific **period** the **archive** setting specifies how long recordings will be kept on disk, ranging from 1 day to 10 years. Old recordings will be deleted to make place for new ones. Select “All recordings” if no recordings are to be removed.

Time Source: Build file names with the current **system time** or with the **time of recording** information. When system time is selected the current UTC time will be used, with the condition that the time zone of the computer is correctly set. See also time keeper note explained in the beginning of heading 6.

Buffer status: indicator shows the component’s input FIFO buffer fill status.

6.53 LAPB

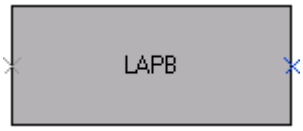


Figure 6-128: LAPB software component symbol

Purpose: Configure LAPB protocol parameters and strip transmission protocol frames and headers so that only valid information frames remain.

Inputs: Single input accepts data in EDR V2.0 format containing LAPB packages.

Outputs: One output. Data in EDR-V2 format stripped from the LAPB transportation protocol.

Configuration: Double click the LAPB software component symbol in the session configuration diagram. Following dialog is shown:

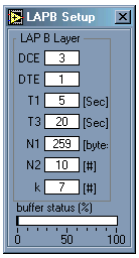


Figure 6-129: LAPB Configuration interface

Configuration of the following parameters is only necessary when the software component is connected to an “Active” connection on a hardware device.

DCE address

DTE address

T1 The retransmission timer (T1) determines how long a sent frame can remain unacknowledged.

T3 Specifies the time in milliseconds to wait before considering the link to be disconnected.

N1 The maximum number of bits in an I-frame.

N2 Maximum number of attempts to complete the successful transmission of a frame.

k Maximum number of outstanding I-frames (window).

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.54 Link1Convert

Figure 6-130: Link1Convert software component symbol

Purpose: Convert Link1 digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean Link1 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the Link1Convert configuration screen. Data format can be D6 or text.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the Link1Convert software component symbol in the session configuration diagram. Following dialog is shown:

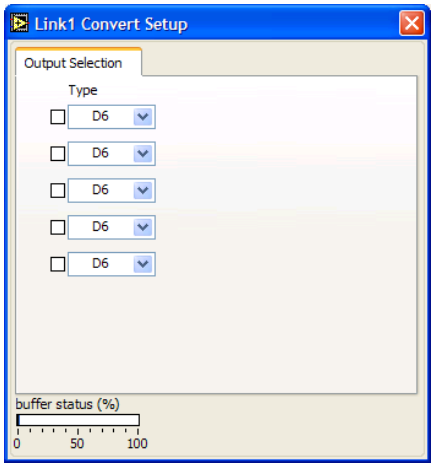


Figure 6-131: Link1Convert Configuration interfac

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.55 pcapInput

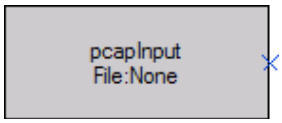


Figure 6-132: pcapInput software component symbol

Purpose: Direct network access for package capturing. Capture raw packets, both the ones destined to the machine where it's running and the ones exchanged by other hosts (on shared media), filter the packets according to user-specified rules before dispatching them to the application**.**

This tool can only be used if WinPcap is installed which can be downloaded from http://winpcap.polito.it/ or installed from the RASS-R installation DVD.

Inputs: None, direct interface with network adapters or saved capture file (for example a *.pcap file saved with the Ethernet sniffer Wireshark, http://www.wireshark.org/)

Outputs: One output. Data in EDR-V2 format.

Configuration: Double click the pcapInput software component symbol in the session configuration diagram. Depending on the source selection one of the following dialogs is shown:

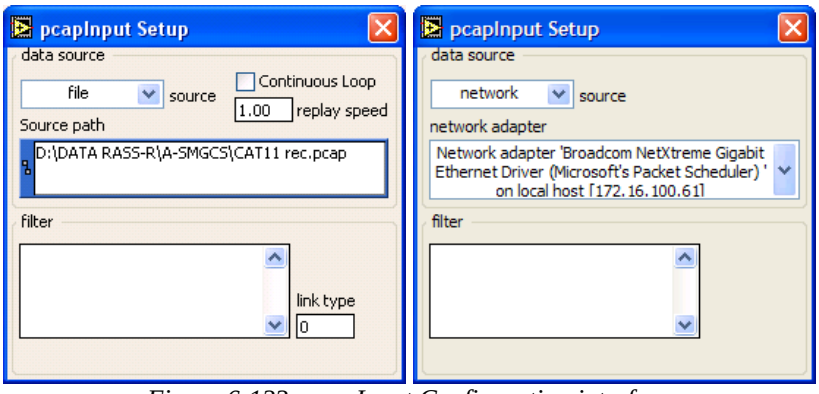


Figure 6-133: pcapInput Configuration interface

Source: You can output all received data on the network card (network source) or output the data originating from a file (file source). Depending on the source selection the dialog shows other options.

Source path: is the **full path to the *.pcap file** from which you wish to retrieve the data. (See also figure above!)

Network adapter: Select the network adapter on which you wish to capture data.

Filter: Enter a filter which you wish to apply to the data. See http://www.tcpdump.org for a full explanation of the filter language. Wireshark **capture** filters use the same language.

Link type: Select the link layer protocol that is used:

1. no link-layer encapsulation (default)
2. Ethernet (10Mb)
3. Experimental Ethernet (3Mb)
4. Amateur Radio AX.25
5. Proteon ProNET Token Ring
6. Chaos
7. IEEE 802 Networks
8. ARCNET, with BSD-style header
9. Serial Line IP
10. Point-to-point Protocol
11. FDDI

Common filter examples:

Capture all traffic to and from the Ethernet address 08:00:08:15:ca:fe.
Ether host 08:00:08:15:ca:fe

Capture all traffic to and from the ip address 192.168.0.10
Host 192.168.0.10

Capture all traffic to and from the TCP port 80 (http) of all machines
Tcp port 80

Capture all traffic to and from the ip address 192.168.0.10 except http
Host 192.168.0.10 and not tcp port 80

6.56 pcapOutput

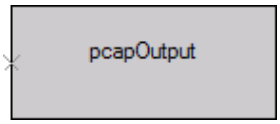


Figure 6-134: pcapOutput software component symbol

Purpose: This module can send a digital data stream to an Ethernet adapter installed on the pc. It gives the possibility to create a header and footer.

Inputs: All type of data.

Outputs: Can be HEX format, Ethernet or FDDI, being output by the network adapter.

Configuration: Double click the pcapOutput software component symbol in the session configuration diagram. Depending on the type selection one of the following dialogs is shown:

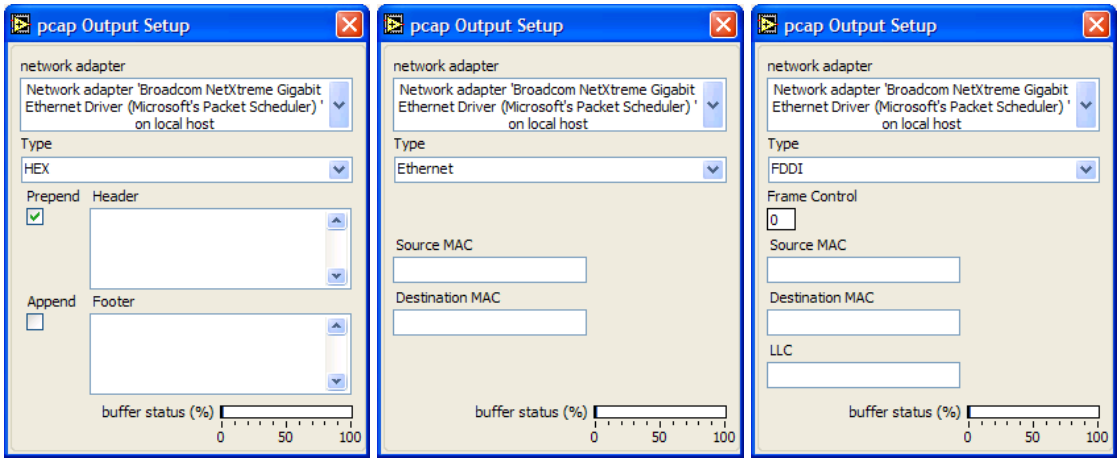


Figure 6-135: pcapOutput Configuration interface

When hexadecimal is selected as type, you can prepend a header or append a footer, composed in hexadecimal characters.

When Ethernet is selected as type, you can fill in a source and destination MAC address.

When FDDI is selected as type, you can fill in a source and destination MAC address, as well as the frame control field and the LLC.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.57 RadarInput

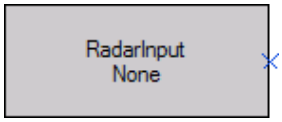


Figure 6-136: RadarInput software component symbol

Purpose: A named radar output that is published (made available to other applications) by another DHM server, can be input again by connecting to the remote DHM server.

Inputs: None. Application needs to connect to a DHM server with an active RadarOutput.

Outputs: Single output in D6 format.

Configuration: Double click the RadarInput software component symbol in the session configuration diagram. Following dialog is shown:

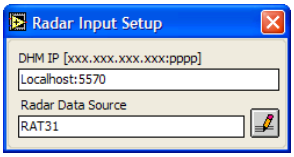


Figure 6-137: RadarInput Configuration interface

Click and the following dialog is shown:

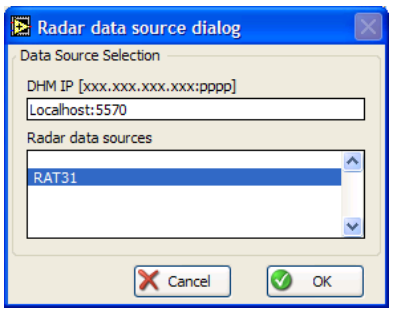


Figure 6-138: Data source selection

Fill in the IP address and port (default this is 5570) from the DHM server you want to connect to. Press in the radar data sources box and the available data output sources will be shown.
Radaroutputs that are running on that DHM server will be listed here. Select and press OK to configure them as RadarInput.

6.58 RadarOutput

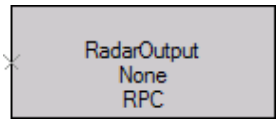


Figure 6-139: RadarOutput software component symbol

Purpose: Publish (make available to other applications) a named radar output, this allows other applications to connect to a D6 data stream. (e.g. the MRD3)

Inputs: Single input accepts data in D6 format.

Outputs: None: applications need to subscribe to the D6 radar data stream to receive data. When one or more applications are subscribed, behind the name a client counter will show their number.

Configuration: Double click the RadarOutput software component symbol in the session configuration diagram. Depending on the type selection one of the following dialogs is shown:

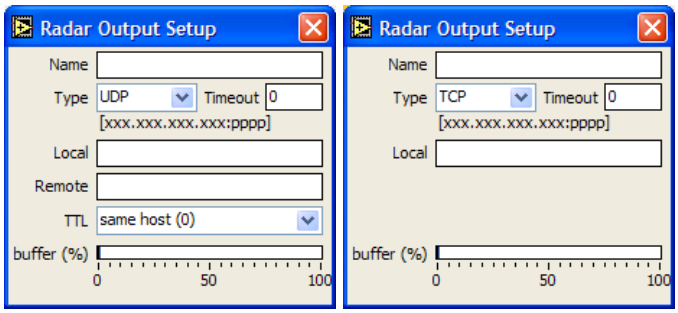


Figure 6-140: RadarOutput Configuration interface

RadarName: The name of the published data, applications that connect to the DHM get a list of RadarOutputs and can select a certain output based on the **RadarName.**

Type UDP: When more than one network adapter is installed on the computer running the connected DHM server, fill in the **local** network adapter's ip address and the port number from which you wish to initiate UDP/IP communication.

In the **remote** field, fill in the IP address and port number to which the data is sent; or the multi- or broad cast address and port number on which the data is casted.

TTL: Time-To-Live

Type RPC: **RPC** is no longer supported.

Type TCP: In case that **TCP** is selected as type, fill in the IP address and port number to which the data is sent.

Overrun Timeout: If the subscribing application doesn't collect the data at regular interval, the output buffers will fill up. When full no further processing can take place and the module halts execution. After specified timeout the output buffer's data will however be overwritten and execution may continue.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

6.59 RAT31DLConvert

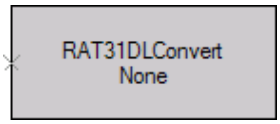


Figure 6-141: RAT31DLConvert Software component symbol

Purpose: Converts RAT31DL digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in RAT31DL format.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the RAT31DL configuration screen. As output, D6 format, text format and EDR V2.0 format are supported. Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the RA31DL software component symbol in the session configuration diagram. Following dialog is shown:

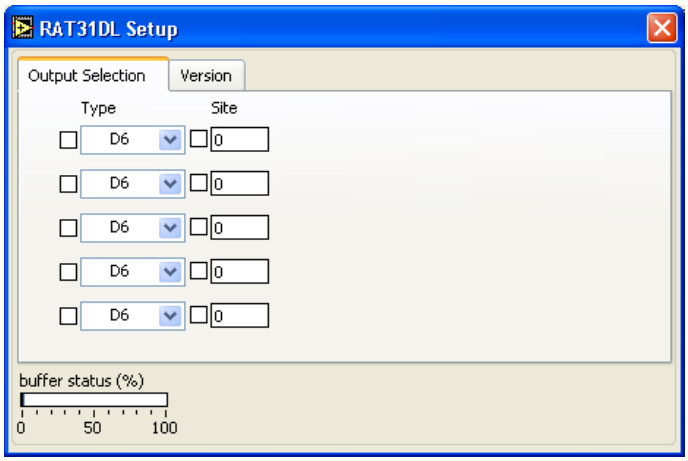


Figure 6-142: RAT31DLConvert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality

Click on the checkbox next to the **Site** field to filter on a site number. Fill in the site number in the appropriate field.

In the Version tab select “Standard” version. “SR/SSR Plot Message Code = 41” is implemented on only one unique radar.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.60 RDIFConvert

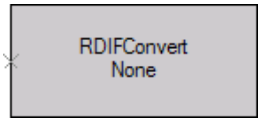


Figure 6-143: RDIFConvert Software component

Purpose: Convert digital messages RDIF interface format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean RDIF data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the RDIFConvert configuration screen. D6, txt, Replay and EDR V2.0 are supported. Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the RDIFConvert software component symbol in the session configuration diagram. Following dialog is shown:

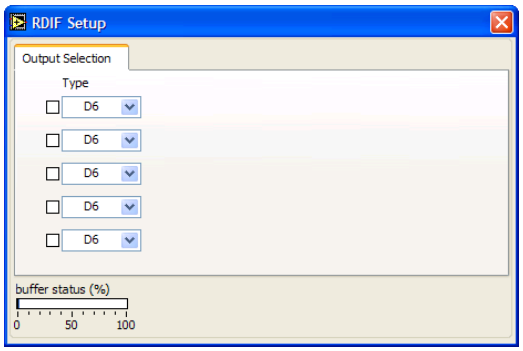


Figure 6-144: RDIFConvert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.61 ReplayRecorder

Figure 6-145: ReplayRecorder software component symbol

Purpose: When an EDR recording needs to be replayed using the RASS-R Data Replay tool, the ReplayRecorder will mark the different timestamp positions in the file. During playback of the data formatted as “Replay”, the timestamps can more easily be replaced with current time stamps.

Inputs: 12 sources can be accepted as input. This means that more than one source may be configured; the data is then combined into a single recording. Input data must have the correct data format ‘replay’.

Outputs: None, stores output file on disk. (.rpl-file)

Configuration: Double click the ReplayRecorder software component symbol in the session configuration diagram. Following dialog is shown:

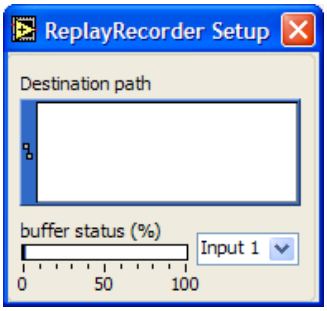


Figure 6-146: ReplaySetup Configuration interface

Choose the correct destination path where to save the .rpl-file.

Buffer status: indicator shows the component’s input FIFO buffer fill status, depending on the selected input line.

This module needs to be used to process EDR data into a replay-file (.rpl). This type of file can only be used in combination with the Data Replay tool. (Refer to the manual from the Data Replay tool)

6.62 Replay

Figure 6-147: Replay software component symbol

Purpose: When a replay is started using the RASS-R Data Replay tool, the tool will connect to a DHM session that is running a Replay software component. The replay module can synchronous replay up to 12 sources.

Inputs: None. The RASS-R Data Replay Tool makes connection to this software component.

Outputs: 12 outputs, for replay with or without original timestamp. Data is output in EDR V2.0 format.

Configuration: Double click the Replay software component symbol in the session configuration diagram. Following dialog is shown:

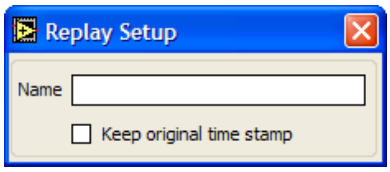


Figure 6-148: Replay configuration interface

Give in the name for the Replay session. This name will be visible in the RASS-R Data Replay tool dialogs. Use the tickbox to replay with original time stamps instead of actual timestamps.

Status: Right click the Replay software component symbol in the session configuration diagram. Following dialog is shown:

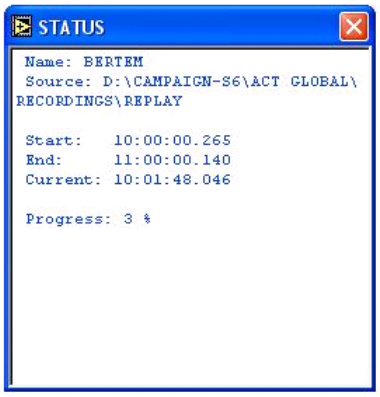


Figure 6-149: Replay status

This module can only be used in combination with the Data Replay tool. (Refer to the manual from the Data Replay tool)

6.63 RSRPConvert

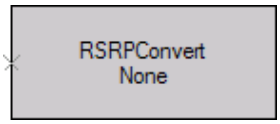


Figure 6-150: RSRP Software component

Purpose: Converts RSRP digital messages format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in RSRP format.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the RSRP configuration screen.
Supported output formats are: D6 format, text format, EDR V2.0 and Vector.
Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the RSRPConvert software component symbol in the session configuration diagram. Following dialog is shown:

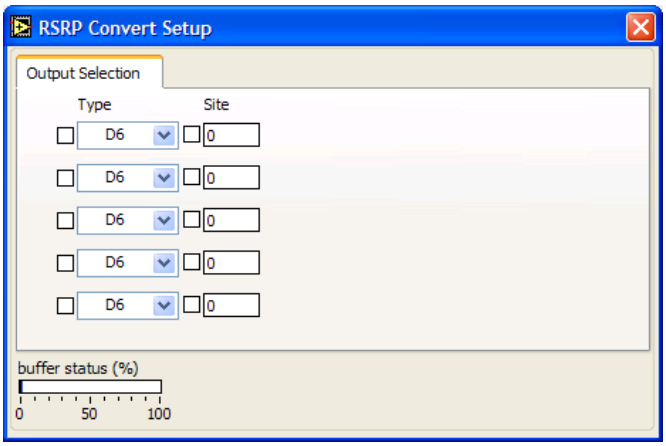


Figure 6-151: RSRPConvert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality

Click on the checkbox next to the **Site** field to filter on a site number. Fill in the site number in the appropriate field.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.64 RSRPPacketizer

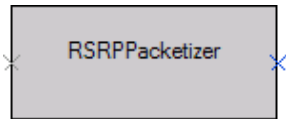


Figure 6-152: RSRPPacketizer software component

Purpose: Serial input of RSRP digital data messages.

Inputs: Input must be a COMMInput.

Outputs: The RSRP output must be followed by a RSRPConvert software component.

Configuration: Double click the RSRPPacketizer software component symbol in the session configuration diagram. Following dialog is shown:

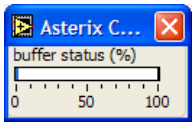


Figure 6-153: RSRPPacketizer Configuration interface

No configuration is needed; the “buffer status” indicator shows the component’s input FIFO buffer fill status.

Status: Right click the RSRPPacketizer software component symbol in the session configuration diagram and select status. Following dialog is shown:

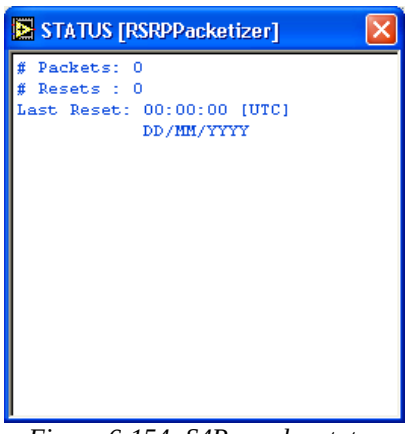


Figure 6-154: S4Recorder status

The status display shows how many packets where processed and how many times and when it last received a reset.

Resets could have caused loss of data. If number of resets is high this could indicate a malfunctioning or overloaded connection.

6.65 RVR

Figure 6-155: RVR Software component

Purpose: Interface with hardware RVR device (e.g. RVR680 or RVR481) on the condition that it is connected to a **MDI561/2!** The software components are enumerated within the square brackets; there will be as many RVR modules as there are RVR devices connected to the system.

Each RVR module can only be instantiated once.

Inputs: None, direct interface RVR device hardware.

Outputs: Video stream must be connected to a VideoOutput software component.

Configuration: Double click the RVR software component symbol in the session configuration diagram. Following dialog is shown:

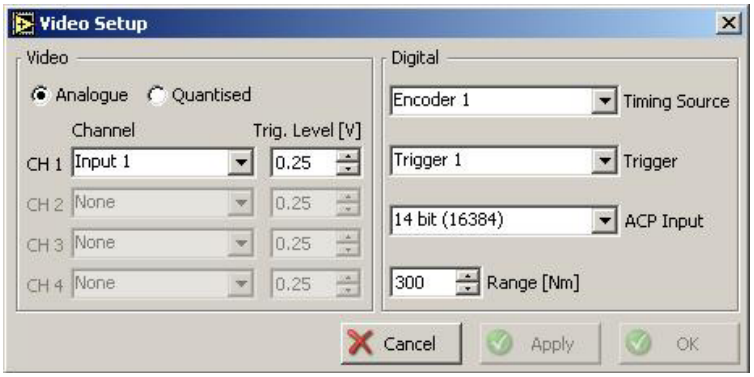


Figure 6-156: RVR Configuration interface

Video Source: In case **analogue video** is selected, the user can only select one input channel out of 8 possible inputs.
In case **quantised video** is selected, up to four inputs can be combined into one video bit. Notice that the four inputs for the quantised mode do not have to correspond with the hardware inputs on the MDI65x (Maintenance Display Interface).

Trigger level: The trigger level determines the threshold value below which no video is sampled (in Volts).

Timing Source: This control selects between encoder input 1 or 2 or composite video input 7 or 8.

Trigger: This control selects the source of the trigger pulses. This control selects the trigger (zero range) between trigger input 1 (on MDI front panel), trigger input 2, composite video on video input 7 or composite video input 8.

ACP input: Select the correct ACP value (12, 14 or 16 bit)

Range: Limits the range in Nm for the input video.

6.66 S4Recorder

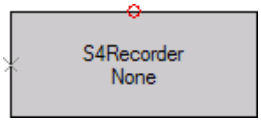


Figure 6-157: S4Recorder software component

Purpose: Record S4 information onto disk. Recording can group S4 records together and archive recordings based on the configuration settings. S4 information is used as a RASS-S inter-application data exchange format. (For example RASS-S Inventory Tool, but also in the RASS-R Radar Comparator Mono/Dual)
A S4-file is recorded in a folder with the same name as the S4-files.
All S4-files (folders) are recorded in the folder as specified in the Destination Path. (There is no grouping of folders per day as in the EDRRecorder.)
See also the example at the end of this section.
You can change the name of the S4-file afterwards, though the name of the folder and file must be the same!

Inputs: Single input accepts data in S4 format from multiple sources. This means that more than one source may be configured; the data is then combined into a single recording. Event input accepts event data (North, Sector crossing, Sector 0).

Outputs: None, stores .S4RD output files on disk.

Configuration: Double click the S4Recorder software component symbol in the session configuration diagram. Following dialog is shown:

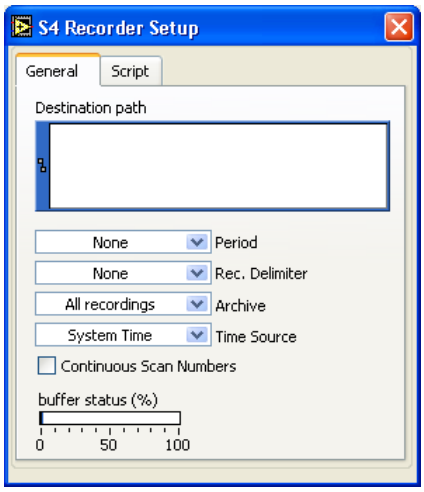


Figure 6-158: S4Recorder Configuration interface

Destination path: Enter a destination path; this is the **full path to the directory** in which you wish to store the recordings.

The files are stored on the machine where the DHM background server is running.

Period: Select a Period ranging from 1min to 3months to specify the file size. Recordings are stored in chunks of **period** size, select “none” for continuous recoding in one data file.

Rec. Delimiter: S4 Records can be grouped together in the recording file based on the delimiter setting.

None	Each S4 record is stored as a separate entity in the recording.
ARP (Event)	S4 records are grouped together in the recording based on ARP events.
North (Event)	S4 records are grouped together in the recording based on North events.
Sect 0 (Event)	S4 records are grouped together in the recording based on Sector 0 events.
Time (Event)	S4 records are grouped together in the recording based on Time events.
North (S4)	S4 records are grouped together in the recording based on S4 North events.
Sector 0 (S4)	S4 records are grouped together in the recording based on S4 Sector 0 events.

Make sure that an Event Source is configured when using an event as delimiter.

Archive: When using a specific **period** the **archive** setting specifies how many recording files will be kept on disk, ranging from 1 to 5000 recordings. Old recordings will be deleted to make place for new ones. Select “All recordings” if no recordings are to be removed.

Time Source: When using a specific **period** the **Time Source** setting specifies the time reference that is used to build the file name. When system time is selected, the UTC time will be used with the condition that the time zone of the computer is correctly set. See also time keeper note explained in the beginning of heading 6.

Continuous Scan Numbers: When selected the scan numbering will continue over multiple files; if not selected each file will start with scan 1.

Buffer status: indicator shows the component’s input FIFO buffer fill status.

Status: Right click the S4Recorder software component symbol in the session configuration diagram. Following dialog is shown:

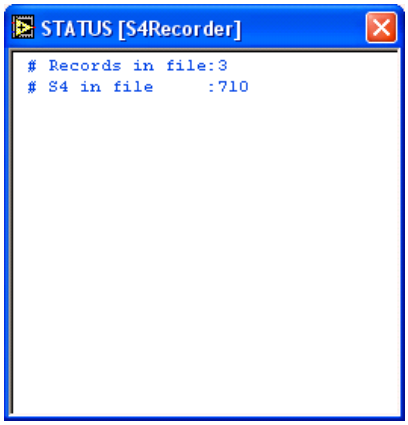


Figure 6-159: S4Recorder status

The status display shows how many records are recorded in the S4-file and how many S4 messages are recorded. (A record can contain multiple S4 messages as defined in the Record Delimiter: when this is set to <none>, the number of “Records in file” and “S4 in file” will be the same!)

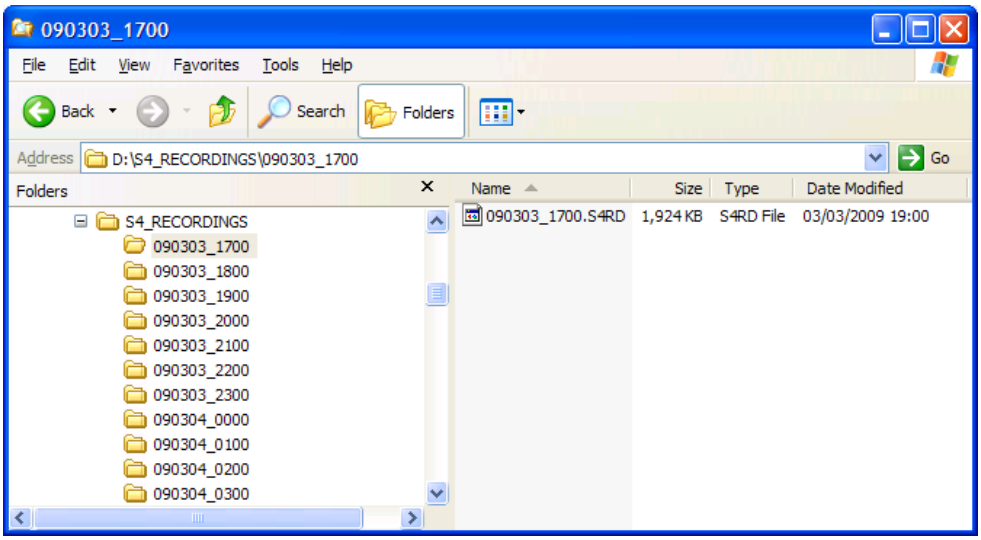


Figure 6-160: Example of a S4 recorder file structure

6.67 StatusOutput

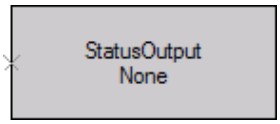


Figure 6-161: StatusOutput software component symbol

Purpose: Publish (make available to other applications) a named status output, this allows other applications to connect to a status data stream. (e.g. MRD3)

Inputs: Single input accepts data in status format.

Outputs: None. Publishes status data. Applications need to subscribe to the data to receive a status datastream. When one or more applications are subscribed, "none" will show their number as client counter.

Configuration: Double click the StatusOutput software component symbol in the session configuration diagram. Following dialog is shown:

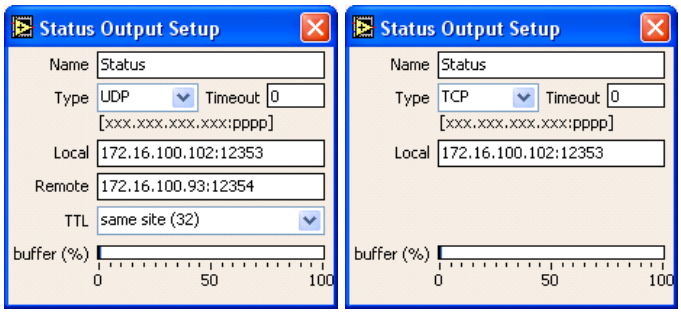


Figure 6-162: Status Output Configuration interface

Radar Name: The name of the published data, applications that connect to the DHM get a list of RadarOutputs and can select a certain output based on the **Radar Name.**

Type UDP: Fill in the **local** network adapter's ip address and the port number from which you wish to initiate UDP/IP communication.

This is only necessary when multiple network adapters are installed on the computer running the DHM server.

In the **remote** field, fill in the IP address and port number to which the data is sent; or the multi- or broad cast address and port number on which the data is casted.

TTL: Time-To-Live.

Type RPC: Disabled, RPC is no longer supported.

Type TCP: Fill in the IP address and port number to which the data is sent.

Overrun Timeout: If the subscribing application doesn't collect the data at regular interval the output buffer eventually will become full causing the module to halt further execution. When a timeout is specified the output buffer's data will be overwritten after the specified timeout and execution may continue.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

6.68 Synchronize

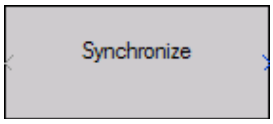


Figure 6-163: Synchronize software component

Purpose: Merge data streams and synchronize packages in their original sequence. Due to the multitasking nature of the DHM it is possible that not all message types are processed equally fast, i.e. target messages might take longer to process than sector messages, when converted data streams are later on merged together it is possible that the original package sequence is lost.

Inputs: Multiple inputs that need merging and synchronizing. The inputs data are given sequence number information in order to be synchronized in the SynchronizeAck module. (AsterixCatSplitter has a synchronize option which numbers packages). Input format is EDR v2.0.

Outputs: Single output which has the merged data stream including sequence number information in the original data format. (EDR v2.0) Output must be sent to a SynchronizeAck software module.

Configuration: Double click the Synchronize software component symbol in the session configuration diagram. Following dialog is shown:

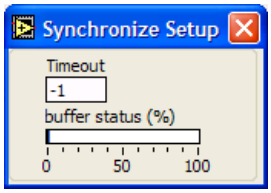


Figure 6-164: Synchronize Configuration interface

Timeout: Fill in the milliseconds the module is allowed to wait for the next package in sequence.
"-1" will let the module wait until the next sequence arrived. So no time out will be generated.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

6.69 SynchronizeAck

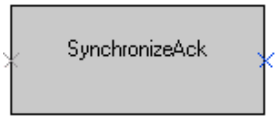


Figure 6-165: SynchronizeAck software component symbol

Purpose: Merge data streams and synchronize packages in their original sequence. Due to the multitasking nature of the DHM it is possible that not all message types are processed equally fast, i.e. target messages might take longer to process than sector messages, when converted data streams are later on merged together it is possible that the original package sequence is lost.

Inputs: Multiple inputs that need merging and synchronizing. The inputs need to have sequence number information in order to be synchronized. (AsterixCatSplitter has a synchronize option which numbers packages). Input must be in EDR v2.0 format.

Care must be taken that all separate data streams which carry package numbers must be presented into the same SynchronizeAck module.

Outputs: Single output which has the merged synchronize data stream in the original data format. (EDR v2.0)

Configuration: Double click the SynchronizeAck software component symbol in the session configuration diagram. Following dialog is shown:

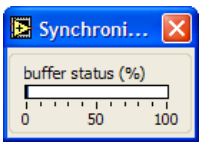


Figure 6-166: SynchronizeAck Configuration interface

No configuration is needed, the “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.70 TCPInput

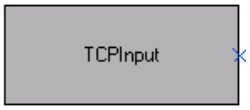


Figure 6-167: TCPInput software component symbol

Purpose: Direct network access for TCP input.

Inputs: None, direct interface with network adapters.

Outputs: One output. Data in bytestream format.

The output needs to be connected to a Packetizer module.

Configuration: Double click the TCPInput software component symbol in the session configuration diagram. Following dialog is shown:

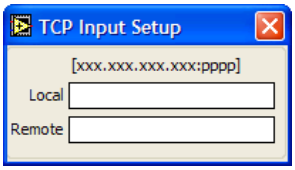


Figure 6-168: TCPInput Configuration interface

Local: The network adapter's ip address and the port number from which you wish to initiate TCP/IP communication. (Only in case when multiple Ethernet adapters are installed on the pc running the DHM server)

Remote: The IP address and port number on which the data server is running.

6.71 TCPOutput

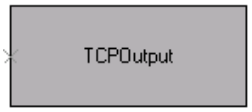


Figure 6-169: TCPOutput software component symbol

Purpose: Direct network access for TCP output, either in server or client mode.

Inputs: One input, accepts data in EDR V2 format.

Outputs: None, direct interface with network adapters.

Configuration: Double click the TCPOutput software component symbol in the session configuration diagram. Following dialog is shown:

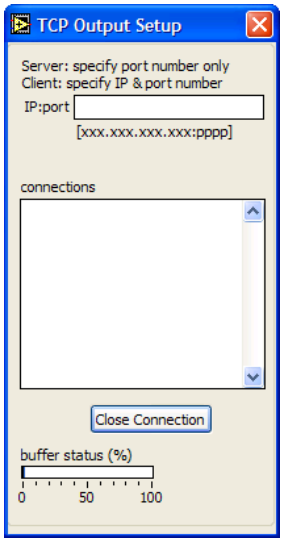


Figure 6-170: TCPOutput Configuration interface

IP:port: The IP address and port on which you wish to start the listening process. When only the port number is provided the module acts as a server and will service any client that connects to it. If both IP number and port number are supplied the module acts as a client and initiates a connection to the remote address and port number.

Connections: If running as server, it shows the list of connected clients, you may disconnect clients by selecting them from the list and then pressing the “Close Connection” button.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.72 TextRecorder

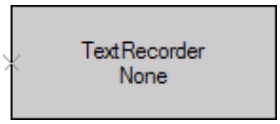


Figure 6-171: Text Recorder software component symbol

Purpose: Record Text information onto disk. Recording can archive recordings based on the configuration settings. Text information can be loaded into any COTS text reader (e.g. notepad).
A text file is recorded in a folder with the same name as the .TXT-files.
All text files (folders) are recorded in the folder as specified in the Destination Path. (There is no grouping of folders per day as in the EDRRecorder.)
See also the example at the end of this section.

Inputs: Single input accepts data in Text format from multiple sources. This means that more than one source may be configured; the data is then combined into a single recording.

Outputs: None, stores output files on disk.

Configuration: Double click the TextRecorder software component symbol in the session configuration diagram. Following dialog is shown:

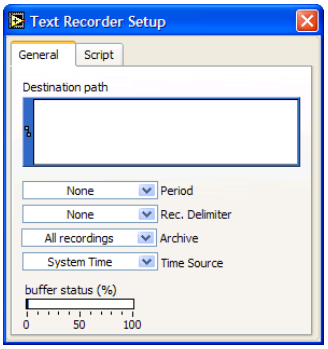


Figure 6-172: TextRecorder Configuration interface

Destination path: Enter a destination path; this is the full path to the directory in which you wish to store the recordings (.TXT-files).

The files are stored on the machine where the DHM background server is running.

Period: Select a Period ranging from 1min to 3months to specify the file size. Recordings are stored in chunks of **period** size, select “none” for continuous recoding in one data file.

Rec. Delimiter: Not used. Each record is stored as a separate entity in the recording.

Archive: When using a specific **period** the **archive** setting specifies how long recording files will be kept on disk, ranging from 1 day to 10 years. Old recordings will be deleted to make place for new ones. Select “All recordings” if no recordings are to be removed.

Time Source: When using a specific **period** the **Time Source** setting specifies the time reference that is used to build the file name. When system time is selected, the UTC time will be used with the condition that the time zone of the computer is correctly set. See also time keeper note explained in the beginning of heading 6.

Buffer status: indicator shows the component's input FIFO buffer fill status.

When you open the probe, the following text probe dialog will open:

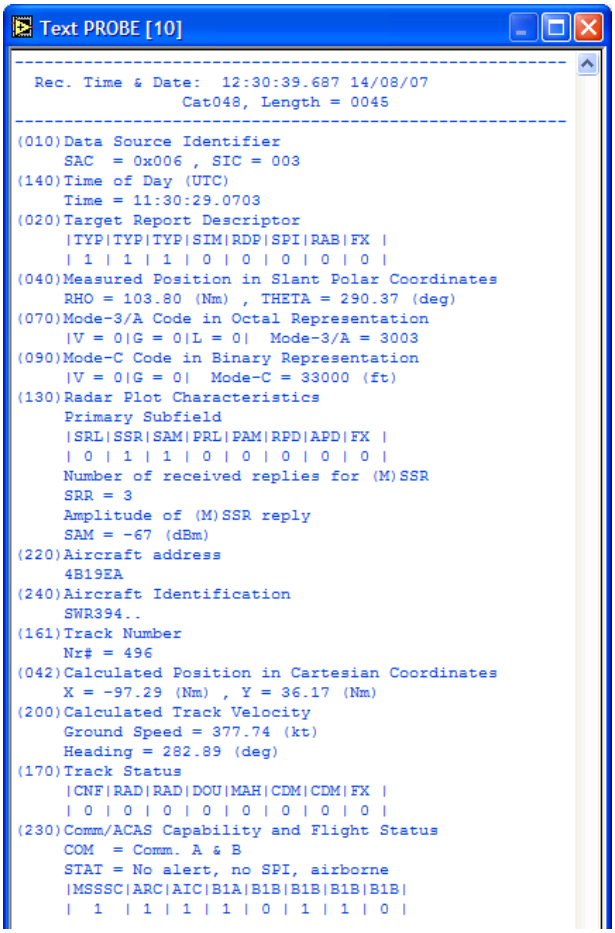

Text PROBE [10]
Rec. Time & Date: 12:30:39.687 14/08/07
Cat048, Length = 0045
(010)Data Source Identifier
SAC = 0x006 , SIC = 003
(140)Time of Day (UTC)
Time = 11:30:29.0703
(020)Target Report Descriptor
|TYP|TYP|TYP|SIM|RDP|SPI|RAB|FX |
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
(040)Measured Position in Slant Polar Coordinates
RHO = 103.80 (Nm) , THETA = 290.37 (deg)
(070)Mode-3/A Code in Octal Representation
|V = 0|G = 0|L = 0| Mode-3/A = 3003
(090)Mode-C Code in Binary Representation
|V = 0|G = 0| Mode-C = 33000 (ft)
(130)Radar Plot Characteristics
Primary Subfield
|SRL|SSR|SAM|PRL|PAM|RPD|APD|FX |
| 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
Number of received replies for (M)SSR
SRR = 3
Amplitude of (M)SSR reply
SAM = -67 (dBm)
(220)Aircraft address
4B19EA
(240)Aircraft Identification
SWR394..
(161)Track Number
Nr# = 496
(042)Calculated Position in Cartesian Coordinates
X = -97.29 (Nm) , Y = 36.17 (Nm)
(200)Calculated Track Velocity
Ground Speed = 377.74 (kt)
Heading = 282.89 (deg)
(170)Track Status
|CNF|RAD|RAD|DOU|MAH|CDM|CDM|FX |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
(230)Comm/ACAS Capability and Flight Status
COM = Comm. A & B
STAT = No alert, no SPI, airborne
|MSSSC|ARC|AIC|B1A|B1B|B1B|B1B|B1B|
| 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 |

Figure 6-173: Text probe

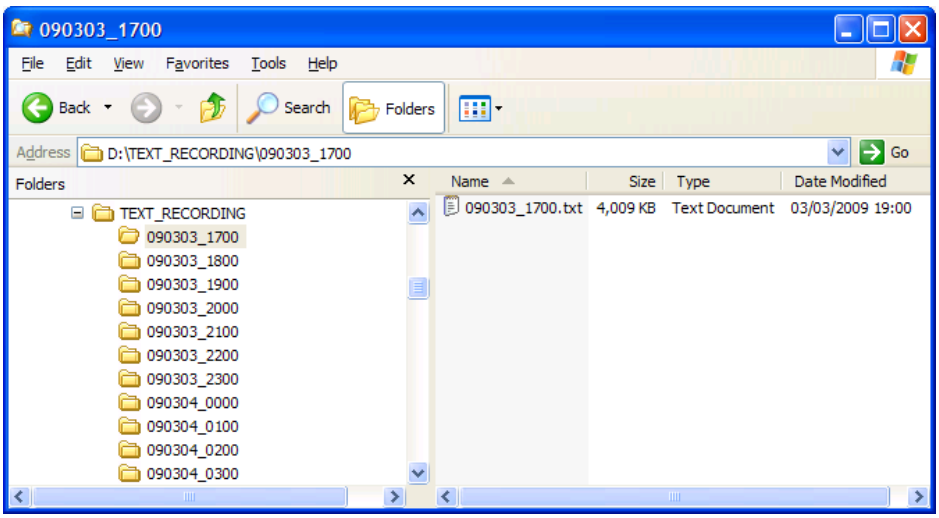


Figure 6-174: Example of a Text recorder file structure

6.73 TMD

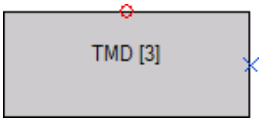


Figure 6-175: TMD Software component

Purpose: Interface with hardware RIM782 or UVR892. The software components are enumerated within the square brackets; there will be as many TMD modules as there are devices connected to the system. Connect this module with a VideoOutput in order to send video to the TMD3 or MRD3.

Each TMD module can only be instantiated once.

Some configuration items are disabled for the UVR892!

Inputs: None, direct interface to RIM782 device hardware.

Outputs: Video stream must be connected to a VideoOutput. (See further)
Event output generates event data (North, Sector crossing, Sector 0).

Configuration: Double click the TMD software component symbol in the session configuration diagram. Following dialog is shown:

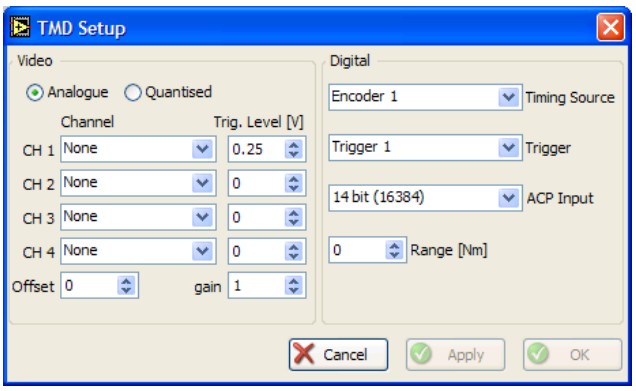


Figure 6-176: TMD Configuration interface

Video Source: In case **analogue video** is selected, the user can only select one input channel out of 6 possible inputs.
In case **quantised video** is selected, up to four inputs can be combined into one video bit.

Trigger level: The trigger level determines the threshold value below which no video is sampled (in volts).

Offset and Gain: These parameters are applied to the video voltage level before sampling, and thus before trigger level, using following formula:

$$Video = 2^{gain} * (Input\ Video - Offset)$$

The **gain** can be set to 0, 1, 2 or 3 so that the resulting gain factor will be respectively 1, 2, 4 or 8.

Timing Source: This control selects between encoder input 1 or 2 or composite video input 7 or 8.

Trigger: This control selects the source of the trigger pulses. This control selects the trigger (zero range) between trigger input 1, trigger input 2, composite video on video input 7 or composite video on video input 8.

ACP input: Select the correct ACP value (12, 14 or 16 bit)

Range: Limits the range in Nm for the input video.

Status: When you right click on the software component and select status, the following status window will open:

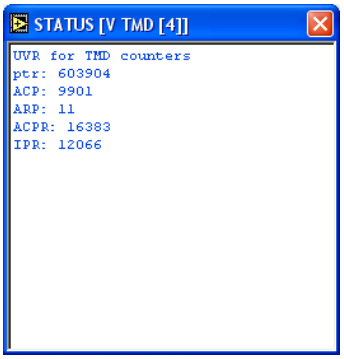


Figure 6-177: TMD Status window

Ptr: Pointer to memory write position
ACP: ACPs received since last reference
ARP: number of received ARPs
ACPR: ACP rate
IPR: Interrogations per revolution (trigger)

6.74 TPS77Convert

Figure 6-178: TPS77Convert software component symbol

Purpose: Convert digital messages TPS77 interface 13-bit CD format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean TPS77 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the TPS77Convert configuration screen. D6 and txt are supported. Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the TPS77Convert software component symbol in the session configuration diagram. Following dialog is shown:

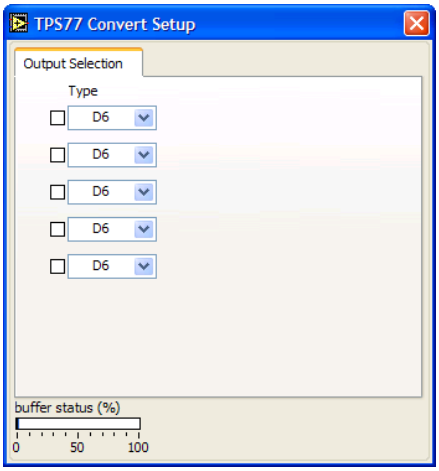


Figure 6-179: TPS77Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.75 TransportLayerTrimmer

Figure 6-180: TransportLayerTrimmer software component symbol

Purpose: Strip transport layer protocol frames and headers so that only valid information frames remain.

Inputs: Single input accepts data in EDR V2.0.

Outputs: One output. Data in EDR-V2 format stripped from the selected transport layer protocols protocol.

Configuration: Double click the TransportLayerTrimmer software component symbol in the session configuration diagram. Following dialog is shown:

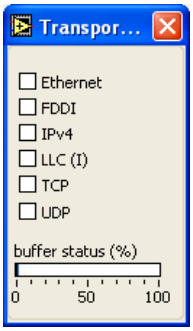


Figure 6-181: TransportLayerTrimmer Configuration interface

Check the respective checkboxes to strip the corresponding transport layer protocol.

The “buffer status” indicator shows the component’s input FIFO buffer fill status

6.76 TVT2Convert

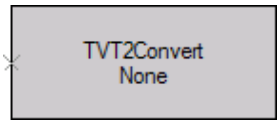


Figure 6-182: TVT2Convert Software component

Purpose: Convert digital messages TVT2 interface format to other formats as described by the output and configuration sections below.

Inputs: Single input accepts data in raw EDR V2 format. This means that the data presented must be clean TVT2 data without the presence of transport protocol framing data.

Outputs: Up to 5 outputs, each output has an associated output format which can be configured using the TVT2Convert configuration screen. D6, txt and EDR V2.0 are supported. Outputs are numbered clockwise starting with the top leftmost blue X.

Configuration: Double click the TVT2Convert software component symbol in the session configuration diagram. Following dialog is shown:

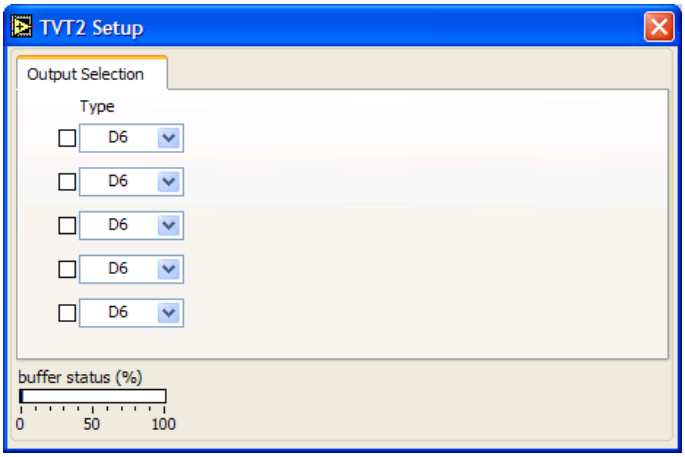


Figure 6-183: TVT2Convert Configuration interface

Click on the checkbox next to the output type selector to enable a conversion output. Select the output format from the Output type selector.

Outputs must be enabled in sequence without gaps starting from the top to ensure correct functionality.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

6.77 U-HDLC

Figure 6-184: U-HDLC software component symbol

Purpose: Strip U-HDLC transmission protocol frames (headers and CRC) so that only valid information frames remain.

Inputs: Single input accepts data in EDR V2.0 format containing U-HDLC packages.

Outputs: One output. Data in EDR-V2 format stripped from the U-HDLC transportation protocol.

Configuration: Double click the U-HDLC software component symbol in the session configuration diagram. Following dialog is shown:

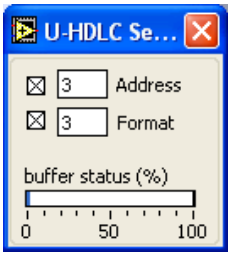


Figure 6-185: U-HDLC Configuration interface

Check/Uncheck the checkbox to exclude the U-HDLC protocol frames. When checked, define the value of the address byte and the format byte. (refer to the U-HDLC protocol description)

The “buffer status” indicator shows the component’s input FIFO buffer fill status

6.78 UDPInput

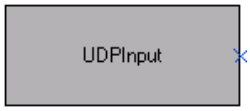


Figure 6-186: UDPInput software component symbol

Purpose: Direct network access for UDP input.

Inputs: None, direct interface with network adapters.

Outputs: One output. Data in EDR V2 format.

Configuration: Double click the UDPInput software component symbol in the session configuration diagram. Following dialog is shown:

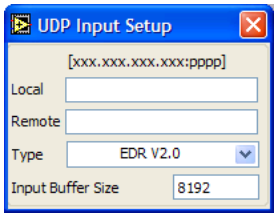


Figure 6-187: TCPInput Configuration interface

Local: The network adapter's ip address and the port number from which you wish to initiate UDP/IP communication. (Only in case when multiple Ethernet adapters are installed on the pc running the DHM server)

Remote: The IP address and port number on which the data server is running. Or the multi- or broad cast address and port number on which the data is casted.

Type: Specify the type of data that is input: EDR V2.0, EDRV2.0 Incl. Header, D6 or S4.

When you select the type, make sure no input module is connected yet to the UDPInput module. Otherwise the following dialog appears:

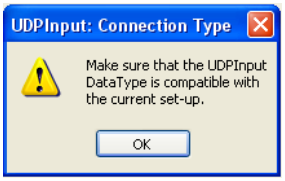


Figure 6-188: UDPInput not compatible

Input buffer size: Fill in the FIFO input buffer size of the network adapter.

The UDPInput module will only be started (turned green) when data is received on the configured IP address and port number!

Status: When you right click on the software component and select status, the following status window will open:

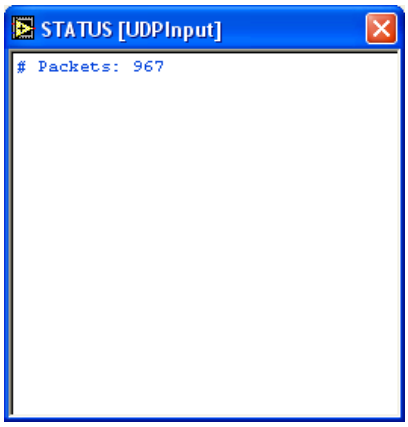


Figure 6-189: UDPInput status

The number of received packets is shown.

6.79 UDPOutput

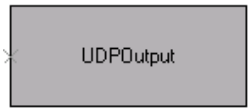


Figure 6-190: UDPOutput software component symbol

Purpose: Direct network access for UDP output.

Inputs: Single input accepts data in EDR V2.0 format.

Outputs: None, direct interface with network adapters.

Configuration: Double click the UDPOutput software component symbol in the session configuration diagram. Following dialog is shown:

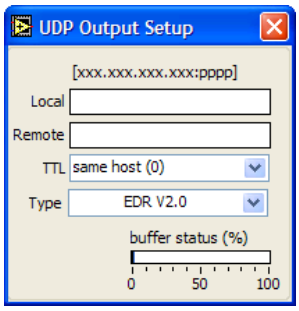


Figure 6-191: UDPOutput Configuration interface

Local: The network adapter's ip address and the port number from which you wish to initiate UDP/IP communication. Currently only localhost is supported. This means that the ip address is not taken into consideration for adapter binding.

Remote The IP address and port number to which the data is sent. Or the multi- or broad cast address and port number on which the data is casted.

TTL Time To Live: number of hops (routers) each packet can pass.

Type: Specify the type of data that is input: EDR V2.0, EDRV2.0 Incl. Header, D6 or S4.

When you select the type, make sure no input module is connected yet to the UDPOutput module. Otherwise the following dialog appears:

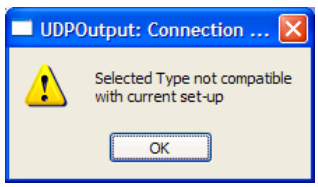


Figure 6-192: UDPOutput not compatible

The "buffer status" indicator shows the component's input FIFO buffer fill status.

An UDPOutput module in EDRv2.0 Incl. Header format can be used to send data to the TMD3. Remark: the TMD3 will only see this UDPOutput when there is data available!

6.80 UDR

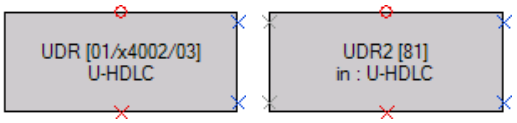


Figure 6-193: UDR software component symbol (left: old UDR600, right: new UDR600[1], RIM782, PRE790 or RDR803)

Purpose: Interface with hardware UDR device. This UDR will be listed when an UDR600, RIM782, PRE790 and/or RDR803 is/are connected to the pc running the DHM server.
The software components are enumerated within the square brackets; there will be as many UDR modules as there are UDR devices connected to the system.

Each UDR module can only be instantiated once.

Inputs: None, direct interface UDR device hardware.

Outputs: Two outputs, one per hardware line. Data is output in EDR V2.0 format.
Event output (0) generates event data (North, Sector crossing, Sector 0).
Event output (X) generates event data (ACP/ARP/PPS).

Configuration: Double click the UDR software component symbol in the session configuration diagram. Following dialog is shown:

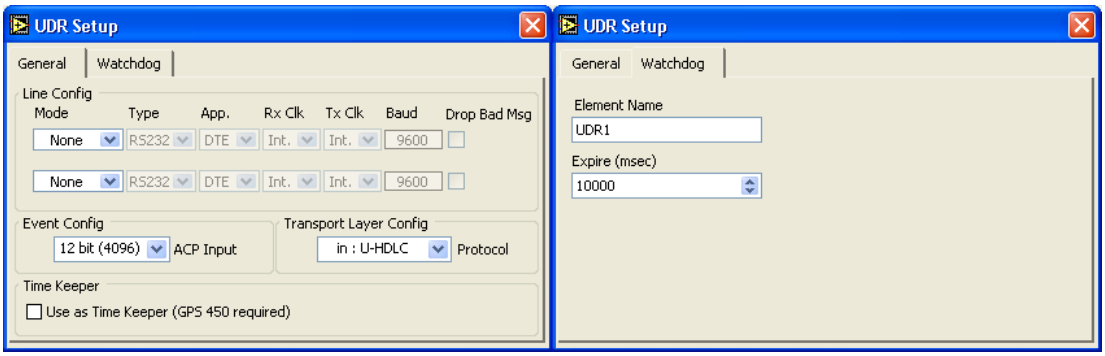


Figure 6-194: UDR Configuration interface

The “Line Config” section allows parameters to be set for each corresponding hardware channel. Lines are numbered from top to bottom starting with line 1.

Mode is the operational mode of the line being configured:

None: Line is not configured.

Passive: Used to monitor/view data, clock is provided externally.

Active: For point-to-point connection with active support for transport protocols. Clock is either provided internally or externally, if provided internally also specify the baud rate.

Y-Passive: Used to monitor/view data from 2 lines, typically transmit and receive pair, clock is provided externally.

[1] An old UDR600 will be named in the windows device manager as UDR HDLC while a new UDR600 is called UDR.

Type is the hardware type of connection, either RS232 or RS422.

App. DTE/DCE disabled. (Only necessary for Active LAP-B which is not supported by the UDR600 and RDR803)

Rx Clk. Receive Clock source, either externally (Ext.) or internally (Int.).

Tx Clk. Transmit Clock source, either externally (Ext.) or internally (Int.).

Baud. The rate of transmission. (Only applicable when the Clock is internally generated and 9600bd default.)

Drop Bad Msg. If enabled, all messages with faulty CRC will be skipped.

In the "Event Config" section you can specify the number of ACPs per rotation.

In the "Transport Layer" section you can specify the transport protocol to be used by the UDR. The following protocols are possible:

UDR600*, RDR803
Input: Bit
Input: Aricat500
Input: CD-13
Input: U-HDLC
Input: Link-1
Input: EV760
Input: TVT2
Output: U-HDLC
Output: Bit
Output: TVT-2
Output: Aircat500

* A UDR600 is also part of the RIM782

Tick the checkbox of the "**Time Keeper**" if you want to use the GPS450 connected to the UDR600 as time keeper for the computer. (See also chapter 6). When the UDR600 is set to output data, it cannot be used as Time Keeper.

Watchdog TAB: *see Watchdog User Manual*.

When you right click on the software component, the following status window will open. In case the CRC of the data is faulty, the "bad" counter increments.

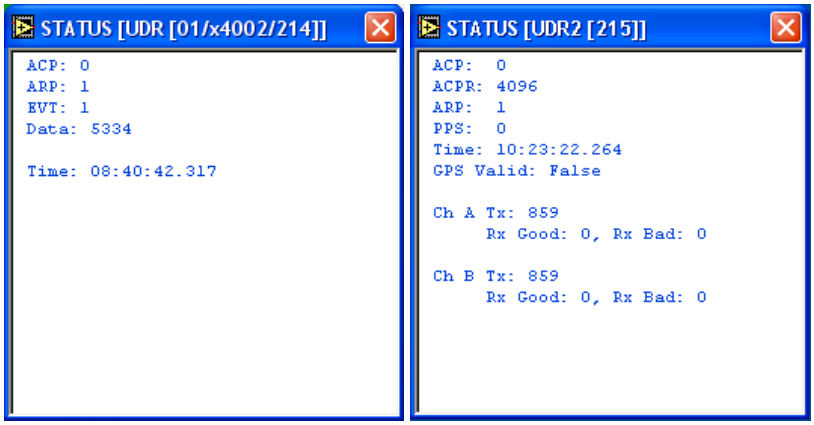


Figure 6-195: Status window (left: old UDR600, right: new UDR600, RIM782, PRE790 or RDR803)

6.81 VectorOutput

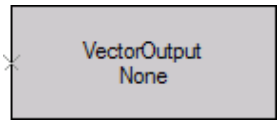


Figure 6-196: VectorOutput software component symbol

Purpose: Publish (make available to other applications) a named vector output, this allows other applications to connect to a vector data stream. (e.g. MRD3)

Inputs: Single input accepts data in vector format.

Outputs: None. Publishes vector data. Applications need to subscribe to the data to receive a vector datastream. When one or more applications are subscribed, "none" will show their number as client counter.

Configuration: Double click the VectorOutput software component symbol in the session configuration diagram. Following dialog is shown:

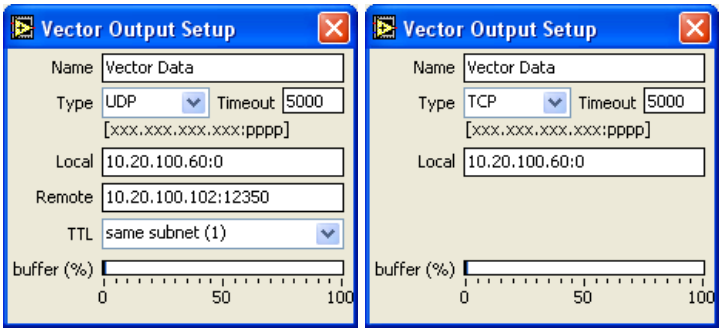


Figure 6-197: VectorOutput Configuration interface

RadarName: The name of the published data, applications that connect to the DHM get a list of VectorOutputs and can select a certain output based on the **RadarName.**

Type UDP: Fill in the **local** network adapter's ip address and the port number from which you wish to initiate UDP/IP communication.

This is only necessary when multiple network adapters are installed on the computer running the DHM server.

In the **remote** field, fill in the IP address and port number to which the data is sent; or the multi- or broad cast address and port number on which the data is casted.

TTL: Time-To-Live: number of routers each packet can pass.

Type RPC: Disabled.

Type TCP: Fill in the IP address and port number to which the data is sent.

Overrun Timeout: If the subscribing application doesn't collect the data at regular interval the output buffers eventually will become full. When this occurs no further processing can take place and the module halts execution. When a timeout is specified the output buffer's data will be overwritten after the specified timeout and execution may continue.

The "buffer status" indicator shows the component's input FIFO buffer fill status.

6.82 VideoOutput

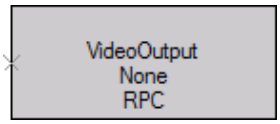


Figure 6-198: VideoOutput software component

Purpose: Publish (make available to other applications) a named video output, this allows other applications to connect to the video stream. (e.g. TMD3 or MRD3)

Inputs: Single input accepts data from a UVR.

Outputs: None. Applications need to subscribe to the video stream to receive the video data. When one or more applications are subscribed, "none" will show their number as client counter. Video data can be received by the TMD3 or the MRD3.

Configuration: Double click the VideoOutput software component symbol in the session configuration diagram. Following dialog is shown:

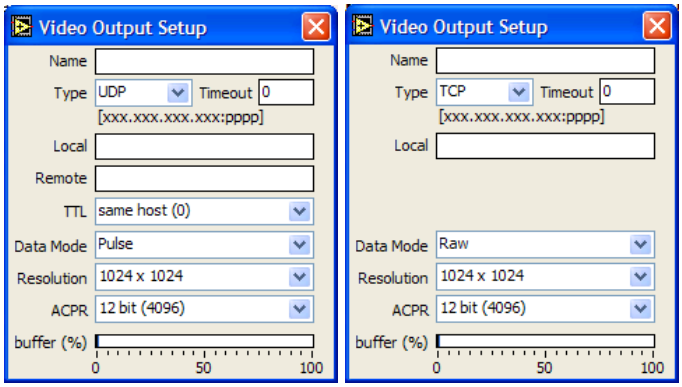


Figure 6-199: VideoOutput Configuration interface

Name: The name of the published data, applications that connect to the DHM get a list of video streams and can select a certain output based on the **Name.**

Type UDP: Fill in the **local** network adapter's IP address and the port number from which you wish to initiate UDP/IP communication.

This is only necessary when multiple network adapters are installed on the computer running the DHM server.

In the **remote** field, fill in the IP address and port number to which the data is sent; or the multi- or broad cast address and port number on which the data is casted.

TTL: Time-To-Live.

Type RPC: Disabled.

Type TCP: In case that TCP is selected as type, fill in the IP address and port number to which the data is sent.

Overrun Timeout: If the subscribing application doesn't collect the data at regular interval the output buffers eventually will become full. When this occurs no further processing can take place and the module halts execution. When a timeout is specified the output buffer's data will be overwritten after the specified timeout and execution may continue.

Data Mode: Pulse mode (to be sent to MRD3 or TMD3), raw mode (to be sent to MRD3 only), raw compressed mode (to be sent to MRD3 only)

Resolution: Choose for the appropriate resolution: 1024x1024, 2048x2048 or 4096x4096.

APCR: Select the correct Azimuth Change Pulse Rate. (12 bit, 14 bit or 16 bit).

The "buffer status" indicator shows the component's input FIFO buffer fill status.

6.83 X25

Figure 6-200: X25 software component symbol

Purpose: Configure X25 protocol parameters and strip transmission protocol frames and headers so that only valid information frames remain. For a detailed description see ITU recommendations on X.25 [1].

Inputs: Single input accepts data in EDR V2.0 format containing X25 packages.

Outputs: One output. Data in EDR-V2 format stripped from the X25 transportation protocol.

Configuration: Double click the X25 software component symbol in the session configuration diagram. Following dialog is shown:

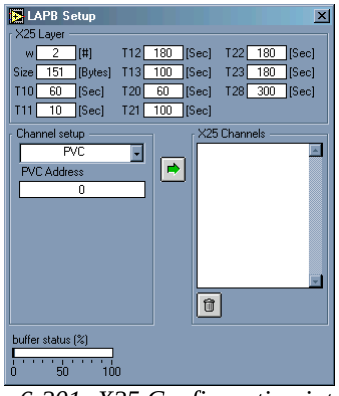


Figure 6-201: X25 Configuration interface

Configuration of the parameters is only necessary when the software component is connected to an “Active” connection on a hardware device.

w:
Size: Maximum frame size
T10: Sets the DCE restart request retransmission timer.
T11: Sets the DCE Call request retransmission timer.
T12: Sets the DCE reset request retransmission timer.
T13: Sets the DCE clear request retransmission timer.
T20: Sets the DTE restart request retransmission timer.
T21: Sets the DTE Call request retransmission timer.
T22: Sets the DTE reset request retransmission timer.
T23: Sets the DTE clear request retransmission timer.
T28: Registration timer.

Channel setup: Make a selection between “PVC”, “SVC in” and “SVC out”, depending on the selection more parameters are available for configuration.

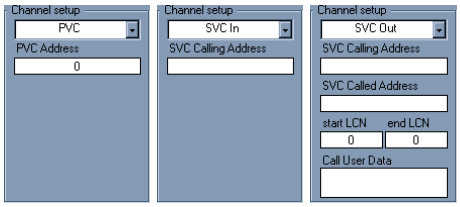


Figure 6-202: X25 Channel setup

PVC Address. The PVC address

SVC Calling Address.: SVC calling address.

SVC Called Address: SVC outgoing call address.

Start LCN end LCN: LCN range between which is rotated.

Call User Data: User definable data.

X25 Channels: A list of configured X25 channels. To add a channel first configure it in the channel setup and then press the “Add channel ( )” button. To remove a channel select it from the list and then press the “delete channel ( )” button.

The “buffer status” indicator shows the component’s input FIFO buffer fill status.

7 File merger

The file merger is a tool to merge different recorder EDR, D6 or S4 files into one file. Suppose that you record EDR-files with a DHM connected to a RDR803, RIM782 or UDR600. You record files from 15 minutes long, but at a certain moment you want to do a replay of a file from 1 hour. Then, the 15 minutes files can be merged to a new file of 1 hour length. This tool collates all data together into one file, in the sequence as the files were selected.

Note that the module does not perform any check on timing or protocol.

In the tools menu, click File Merger to open.

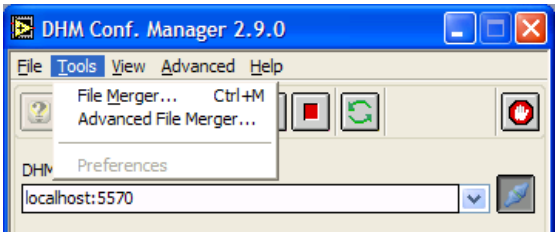


Figure 7-1: Open File Merger

When opening the File Merger, the following window will appear:

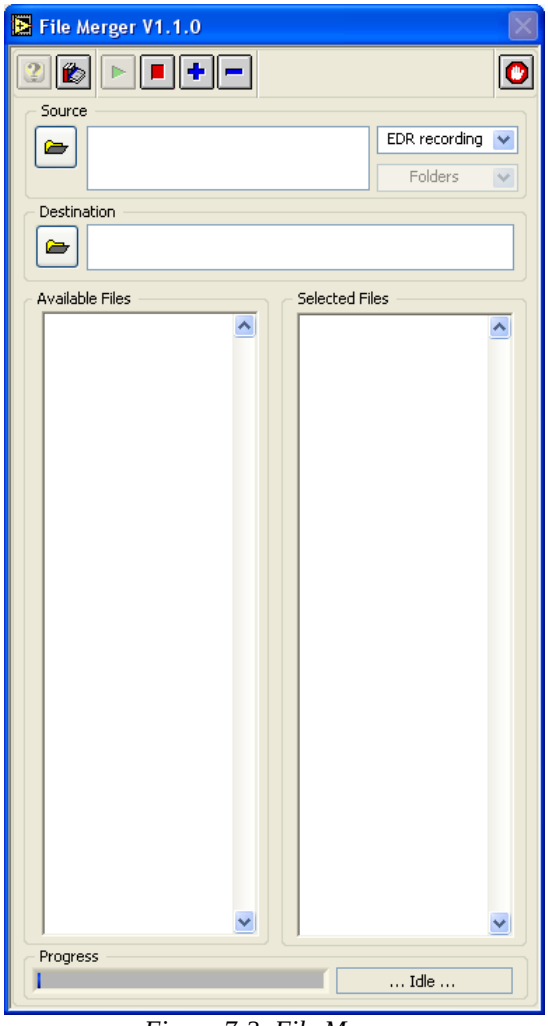


Figure 7-2: File Merger

The table below explains the buttons and fields in the user interface:

Table 7-1: File merger buttons

Button	Usage
Start	When there are files selected to be merged, you can start merging here. (otherwise the button will not be active)
Stop	Stop merging
Add	Click the add button to select a file from the available files to be merged.
Remove	Unselect a file from the list to be merged.
Exit	Quit the application
Source path	Here you can select the source path of the (original recording) files
EDR recording	Select the type of files that will be merged (EDR, D6 or S4)
Folders	If D6 or S4 is selected you have to choose “folders” if the source has subfolders OR “files” if the source folder has no subfolders.
Destination path	Here you can select the destination path of the (collated) file. For EDR this will be a folder and the merged file will get the same name as the name of the source folder. For D6 and S4 a filename can be chosen.
Available Files	When the source path is correctly filled in, the available files will be listed here.
Selected Files	You can make a selection of the files to be merged using the add button.

7.1 How to merge 2 files?

Since the usage of this tool is quite self explanatory, we will explain the tool in a kind of tutorial. Suppose we have different EDR-recordings in the following directory: ‘D:\FileMerger\Files\EDR’ and want to merge these files into one file, placed in another directory called ‘D:\FileMerger\Merged\EDR’. The print screen below shows the different file in Windows Explorer.

Make sure there are only edr-files in the folder and no D6 or S4 file formats.

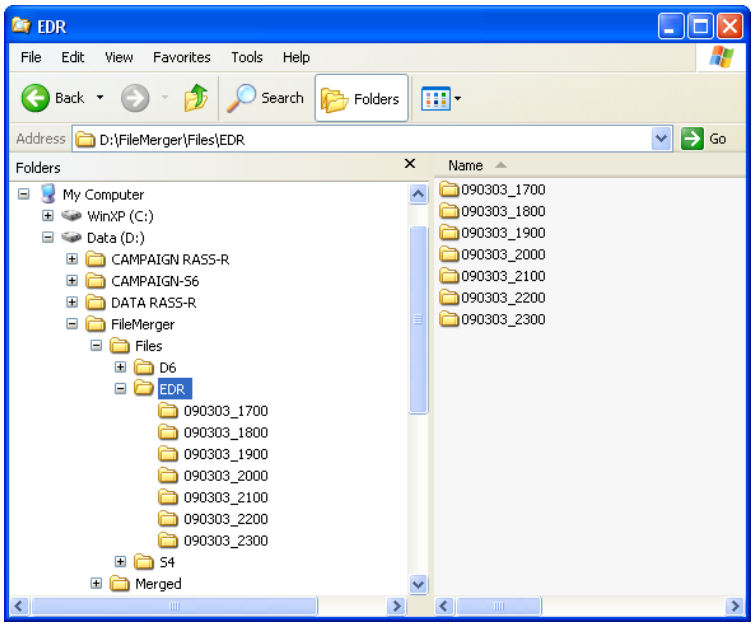


Figure 7-3: Files directory structure

When the File Merger is open, select the correct Source and Destination paths. After a selection of 4 files out of 7 available files, the window will be like this:

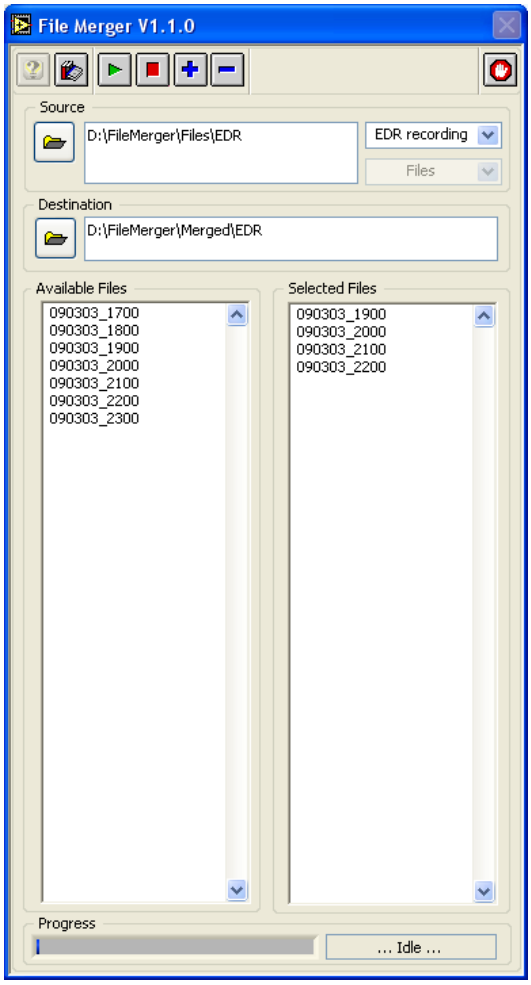


Figure 7-4: Merging 4 files

When you press the start button , the merging process will start as can be seen in the Progress bar.

Now, the result can be seen in the path given in Destination Path field. An example in Windows Explorer can be seen in the next picture.

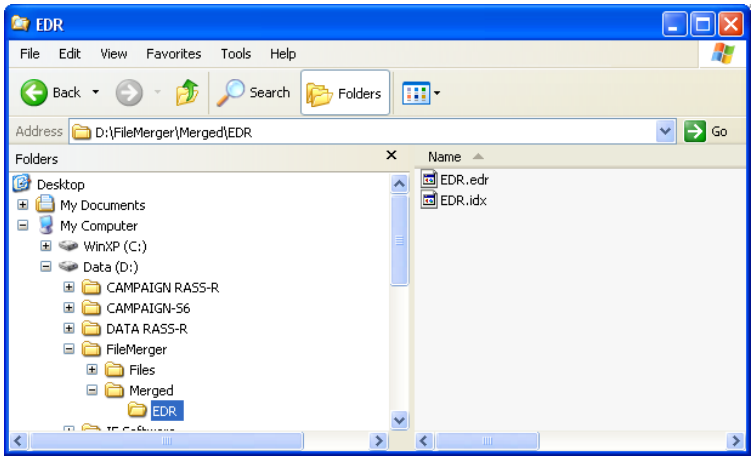


Figure 7-5: Merged file

As you can see, the new merged file will get the same name as the folder where it is created in. If you want to check the merged file, you can make an EDRReplay session in the DHM and verify the data time stamps in the file. The file length is 4 hours now, instead of 4 separate files of one hour.

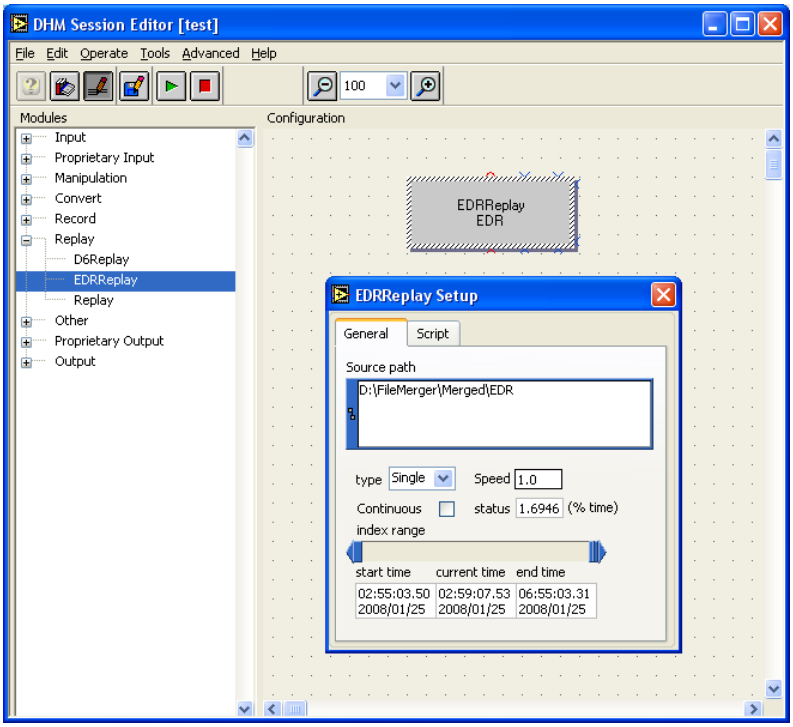


Figure 7-6: Verify file length

8 Advanced File Merger

This tool has the same function as the normal File Merger except that it only merges EDR files. The main difference is that we do not select the different files to be merged by clicking, but we define a time window. For every file in the selected folder tree where the time mentioned as folder name falls in the time window that is selected, the file in that folder will be merged into the new file (see 6.45 for details about EDR recording folders).
In the tools menu, click Advanced File Merger to open.

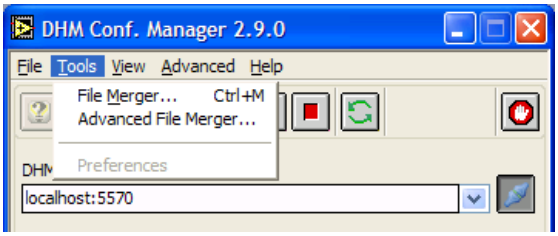


Figure 8-1: Open Advanced File Merger

When opening the File Merger, the following window will appear:

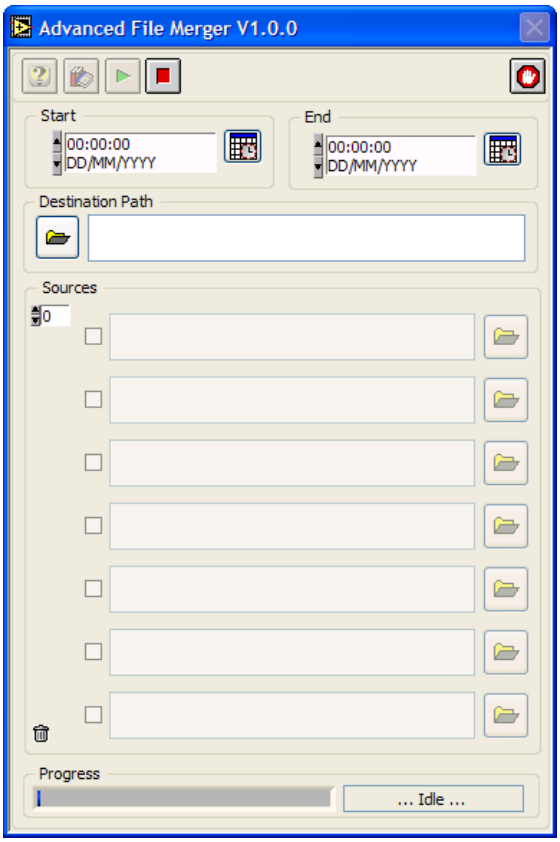


Figure 8-2: Advanced file merger

The table below explains the buttons and fields in the user interface:

Table 8-1: Advanced file merger buttons

Button	Usage
Start	When there are files selected to be merged, you can start merging here. (otherwise the button will not be active)
Stop	Stop merging
Start time	Evokes a 'set time and date window'. Use this to select a lower time limit.
Stop time	Evokes a 'set time and date window'. Use this to select an upper time limit.
Exit	Quit the application
Destination path	Here you can select the destination path of the files. In the user interface, there are 7 destination paths foreseen. However, this number can be increased using the 0 window. You can enable or disable a source path by the tick button.

8.1 How to merge different files?

Since the usage of this tool is quite self explanatory, we will explain the tool in a kind of tutorial. Suppose we have different EDR-recordings in the following directory: "F\RADAR DATA\". This file contains radar data from the 13/08/07 and from 14/08/07. We want to merge some of these files into one file, placed in another directory called 'E:\FileMerger\'. The print screen below shows the different files in Windows Explorer.

Make sure there are only edr-files in the folder and no D6 or other file formats.

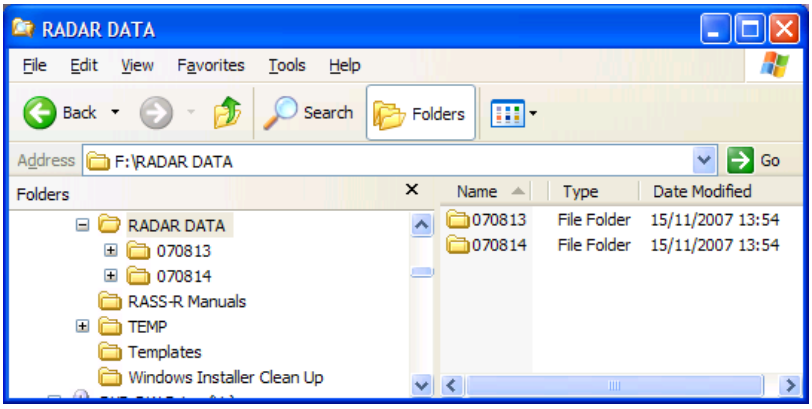


Figure 8-3: Files directory structure

For example, we want to merge the files recorded on 13/08/07 started at 11:15:00 and ended on 14/08/07 at 13:30:00. Set this time using the 'Set time and date window' and by using the increase/decrease buttons.

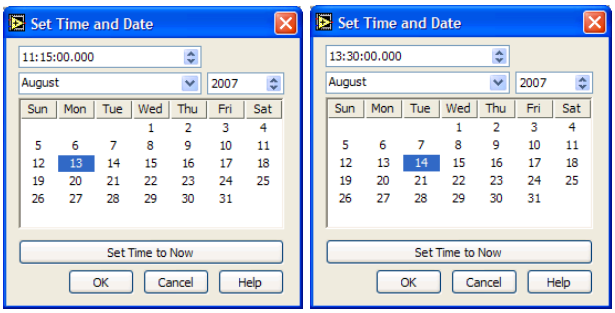


Figure 8-4: Set time and date window

When the File Merger is open, select the correct destination paths. Different source paths can be selected by checking the tick box before the source field. If files must be merged in more than 7 source paths, increase the number of source paths by clicking 0.

Make sure that the source path corresponds to the path that groups the directories of the day! (F:\ RADAR DATA and not F:\RADAR DATA\0708013 or \070814)

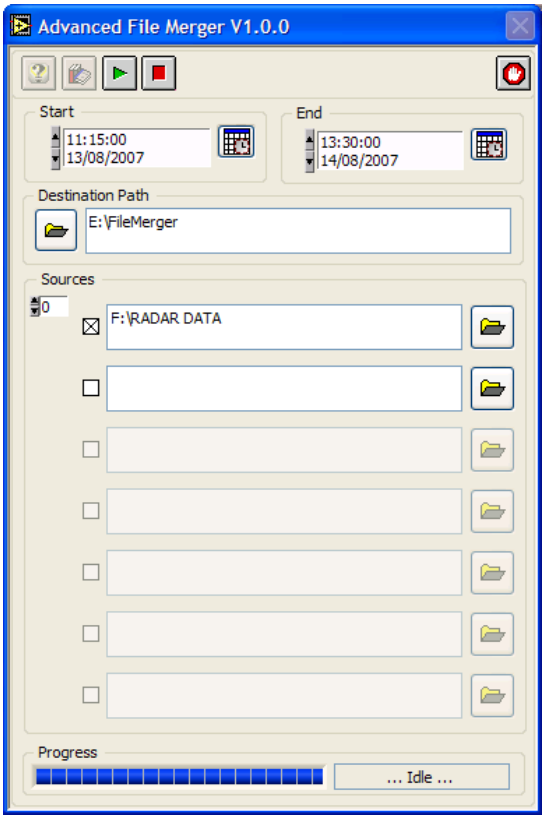


Figure 8-5: Merging 4 files

When you press the start button, the merging process will start as can be seen in the Progress bar.

Similar as in the FileMerger, the merged file can be found in the destination path folder and will have the same name as the folder itself (RADAR DATA.edr and RADAR DATA.idx). If you want to check the file length of the new collated file, use an EDRReplay software component to verify.

9 Troubleshooting

9.1 DHM Configuration Module is not responding

The configuration module or the session editor is not responding. This can happen due to bugs in the configuration monitor which have not yet been resolved. In the event that this happens, use the windows task manager to manually end the YARDIOS_SMGR.exe task. Since the session status and configuration parameters are all kept on the DHM background server you should be able to continue with the configuration when you re-launch the DHM Configuration Module.

9.2 Session start / stop response is very slow

When starting or stopping a session it takes a long time before the status colour switches from grey to green of vice versa (i.e. longer than 2-3 sec). This means that for some reason one of the modules in the session is blocked. Close any session configuration windows that are still open, save the sessions and restart the DHM background server with the windows services management console as described in Chapter 0 .

9.3 A session does not respond/cannot be stopped by the DHM.

Open Windows Task Manager to kill the session. Sessions are listed as "YARDIOS_SESSION_ENGINE_#.exe, with the appropriate session number at position #.

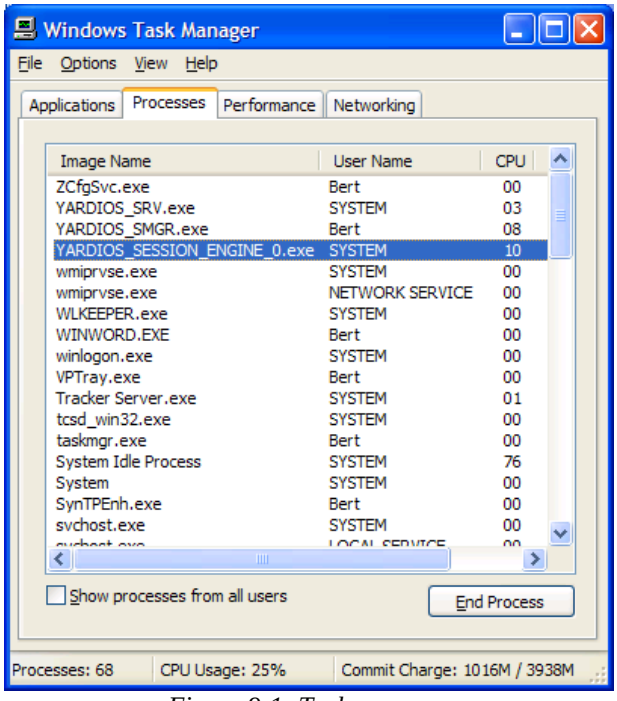


Figure 9-1: Task manager

9.4 IAC not supported when connecting to a DHM server

When you get the error: "IAC not supported...", the first thing to check is the IP settings in the Advanced – DHM Discovery menu. If all IP addresses and Masks are accurate the reason could be that the I.E. Proxy is not installed or the service was started after the DHM service, especially when this was done manually. Solution is to stop both services using windows computer management and restart I.E.-Proxy before you restart the DHM service. A third reason could be when multiple network cards are installed and one is not connected. The “media sense” setting in the registry is disabled when DHM software is installed. Other software installed afterwards could however have enabled it again.

9.5 Proprietary hardware is not discovered by the DHM

When new proprietary hardware (RIM782, RDR803, UDR600) is connected, Windows will auto-detect the device instance and install the proper driver. Should you have purchased new proprietary hardware or, because of maintenance, the hardware was upgraded to a higher version, the driver might not be automatically detected. Installation of the most recent DHM software will be required to solve this issue. Proper installation of the hardware can be checked using Windows ”Device Manager”. Please contact Intersoft Electronics Customer Support Department to receive the most recent DHM software version.

After the hardware is connected and installed by Windows, rescan the DHM for new connected devices, see heading 4.2.8.1. Even when Windows properly installed the driver, especially when the hardware was already installed earlier and has been reconnected, the device might not be recognized in the DHM. This can be checked with the “Manage USB devices” as explained in heading 4.2.8.2 or by looking for the Proprietary Input/Output module in the module list, see heading 4.2.7.1. When the newly added device is not marked with a black dot in the device list or the desired module id not available in the module list, the device is not discovered.
A malfunctioning or too long USB cable, or a dirty or aged USB port, can cause poor connection with the device, causing this error. Try swapping the USB cable and/or connecting the device to a second USB port. Make sure to press the rescan button again. Alternatively you could uninstall and reinstall the device driver manually using Windows “Device Manager”.

Should the device still not be recognized and it is the first time you use the hardware, then an error might be occurred during first registration of the device. Upon first registration, the device is added to Windows registry. When an error caused wrong registration, neither re-installation of the hardware, nor the DHM software will solve the issue. The **registration of the device will have to be removed manually** from Windows registry. This can be done by opening Windows registry: type “regedit” in Windows Run-dialog, Then browse to: “HKEY_LOCAL_MACHINE\SOFTWARE\Intersoft Electronics\USB_DEVICES” and delete the entire USB_DEVICES folder. Note that when deleting this folder, all existing DHM session that call for hardware will no longer function (reason and solution see heading 4.2.8.2).

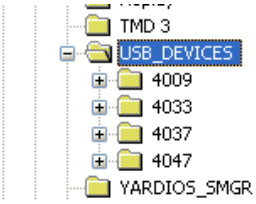


Figure 9-2 USB_Devices Registry setting

If all above fails, please contact Intersoft Electronics Customer Support Department as the hardware might need replacement/maintenance.

Appendix A: error codes

This appendix lists the error codes returned by the RASS-R Data Handling Background Server and the Configuration Module, including the error number, description, occurred when and possible reason.

Table 9-1: DHM Error codes

Code	Description	Occurred when	Possible reason
14	Error 14 occurred at (Module not available) YARDIOS_SESSION_CONFIG ModuleListBocDblClicked Event Callback.vi in YARDIOS_SESSION_CONFIG ModuleListBocDblClicked Event Callback.vi.ProxyCaller	Double-clicking a software component in the DHM configuration module	Cannot add resource. Module is already in use and can be instantiated only once. There is already a software component for the same hardware device on the diagram or in use in another session.
56	Error 56 occurred at Open Allication Reference in YARDIOS_SMGR SetSRV.vi->YARDIOS_SMGR.vi	Pressing the “Connect ()” button in DHM configuration module.	The network operation exceeded the user-specified or System time limit. DHM background server is not running or TCP/IP:Port combination provided in YARDIOS_SRV field is incorrect or unreachable.
60	Error 60 occurred at TCP Create Listener in Internecine Avoider.vi-> TCP Listen.vi-> TCP Server Engine 1.vi	At startup of the DHM background server when manually launched as normal application not as service.	The specified network address is currently in use. Make sure that no other application is using port 5572 and restart the DHM background server.
63	Error 63 occurred at Open Application Reference in YARDIOS_SMGR SetSRV.vi->YARDIOS_SMGR.vi	Pressing the “Connect ()” button in DHM configuration module.	The network connection was refused by the server. DHM background server could not acquire TCP port 5570 at startup. Make sure that no other application is currently occupying TCP port 5570 and restart the DHM background server.
97	Error 97 occurred at unknown system error in YARDIOS_SESSION_CONFIG SetConfigurationFlowchart.vi ->YARDIOS_SESSION_CONFIG.vi	Opening the configuration editor by pressing the “Edit Session()” button.	Labview NULL refnum was passed as input. Problem with ActiveX component loading, restart the DHM configuration manager, keep the background server running.
1004	Error 1004 occurred at Open VI Reference in YARDIOS_SMGR SetSRV.vi->YARDIOS_SMGR.vi	Pressing the “Connect ()” button in DHM configuration module.	The VI is not in memory. Another LabVIEW application is occupying the DHM background server TCP port 5570. Quit the application occupying TCP port 5570 and restart the DHM background server.

REFERENCED DOCUMENTS

Reference	Document
[1]	ITU Recommendations for X.25 10/96; http://www.itu.int/
[2]	POEMS ICD in RASS-S. This is installed with RASS-S. You can find more information about .EDR, .IDX, .IOSS, .IRD IE-DD-00273-002 ICD S4.pdf
[3]	For all ASTERIX categories, refer to the EUROCONTROL website: http://www.eurocontrol.int/asterix/public/subsite_homepage/homepage.html
[4]	ASTERIX Structure, SUR.ET1.ST05.2000-STD-01-01 http://www.eurocontrol.int/asterix/gallery/content/public/documents/pt1ed130.pdf
[5]	D6 ICD, IE-DD-00272-001 ICD D6.pdf